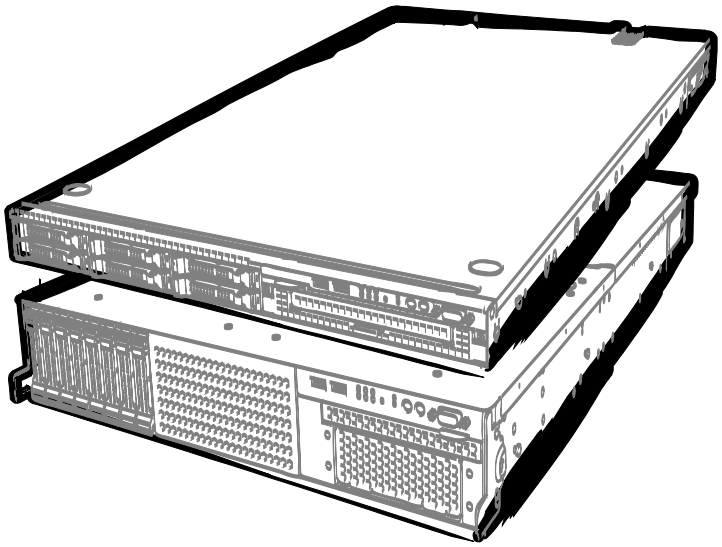
Express5800

NEC



NEC Express Server
Express5800 Series

Express5800/R120d-1M, R120d-2M
EXP291, 292
Maintenance Guide

Model Number: R120d-1M N8100-1794F
R120d-2M N8100-1793F

Chapter 1 Maintenance

Chapter 2 Convenient Features

Chapter 3 Appendix

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Documents Provided with This Product

Documents for this product are provided as accompanying booklets (📖) and as electronic manuals (PDF) stored within EXPRESSBUILDER DVD (💿).

📖 Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖 Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

💿 EXPRESSBUILDER

PDF User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setting Up Your Server	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

PDF Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as NEC ESMPRO and Universal RAID Utility

PDF Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

PDF Other documents

Provides the detail of NEC ESMPRO, Universal RAID Utility, and the other features.

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Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the hardware or operating software. If the procedures described are not followed, **hardware failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard disk drives

Unless otherwise stated, hard disk drives (HDD) described in this document refer to both of the following.

- **Hard disk drives (HDD)**
- **Solid state drive (SSD)**

Removable media

Unless otherwise stated, removable media described in this document refer to both of the following.

- **USB memory**
- **Flash FDD**

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

Refer to *Chapter 1* (*1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document		Official names of Windows
Windows Server 2008 R2		Windows Server 2008 R2 Standard
		Windows Server 2008 R2 Enterprise
Windows Server 2008	*1	Windows Server 2008 Standard
		Windows Server 2008 Enterprise
Windows Server 2003 R2 x64 Edition		Windows Server 2003 R2 Standard x64 Edition
		Windows Server 2003 R2 Enterprise x64 Edition
Windows Server 2003 R2	*2	Windows Server 2003 R2 Standard
		Windows Server 2003 R2 Enterprise
Windows Server 2003	*2	Windows Server 2003 Standard
		Windows Server 2003 Enterprise
Windows 7		Windows 7 Professional 64-bit(x64) Edition
		Windows 7 Professional 32-bit(x86) Edition
Windows Vista		Windows Vista Business 64-bit(x64) Edition
		Windows Vista Business 32-bit(x86) Edition
Windows XP		Windows XP Professional x64 Edition
		Windows XP Professional
Windows PE	*3	Windows Preinstallation Environment

*1: Includes 64-bit and 32-bit Editions unless otherwise stated.
The following appears on EXPRESSBUILDER.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x86

*2: Unless otherwise stated, Windows Server 2003 R2 and Windows Server 2003 are collectively referred to as Windows Server 2003.

*3: Used as an installation platform only.

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Industry Canada Class A Emission Compliance Statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE / Australia and New Zealand Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

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5. **Regardless of these 4 items, NEC Corporation assumes no responsibility for effects resulting from operations.**
6. **The sample values used in this document are not the actual values.**

Keep this document nearby so that you may refer to it as necessary.

Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages and procedures **may differ from the actual screens, messages and procedures.** Substitute as appropriate when content has been modified.

The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

NEC Express5800 Series
Express5800/R120d-1M, R120d-2M

1 Maintenance

This chapter explains maintenance of server, and what actions are to be taken in case of trouble when operating this server.

1. **Transfer, Movement, and Disposal**
   Describes how to transfer this server to a third party. Also describes how to dispose, move and store this server.

2. **Daily Maintenance**
   Describes what you must confirm for daily use, how to manage files, and how to clean the server.

3. **User Support**
   Describes various services on this product.

4. **Collecting Failure Information**
   Describes how to collect information about the location where a failure occurred and its cause when the server malfunctions. Refer to this section in case of a failure.

5. **Troubleshooting**
   Describes how to identify the causes of problems and what actions are to be taken to address them. Refer to this section when you suspect a failure.

6. **Windows System Recovery**
   Describes Windows recovery setup. Refer to this section when Windows is corrupt.

7. **Resetting and Clearing the Server**
   Describes how to reset or clear the server. Refer to this section when the server is not working or when you want to restore BIOS settings to the factory settings.

8. **System Diagnostics**
   Describes the system diagnostics of this server.

9. **Offline Tools**
   Describes tools for preventive maintenance of this product.

1. Transfer, Movement, and Disposal

1.1 Transfer to a Third Party

Observe the following precautions when you transfer (or sell) the server or software provided with the server to a third party.

- **Server**

  When transferring (or selling) the server to a third party, be sure to provide the server's instructions (including electronic manuals) to the third party.

- **Data on the hard disk drive**

  Be sure to erase the data stored in HDD to prevent the leakage of sensitive data (such as customer information or company management information) to any third parties. It is the user's responsibility to erase the data.

  Important **NEC assumes no liability for data leakage should the product be transferred to a third party without erasing the data.**

  Data seems to be erased when you empty "Recycle Bin" of Windows or execute the "format" command of the operating system. However, the actual data remains on the hard disk drive. Data not erased completely might be restored by special software and used for unexpected purposes.

- **Bundled software**

  Observe the following precautions when transferring (selling) the bundled software to a third party.

  – Transfer them with the server.
  – All provided media and documents must be transferred and no backup copies must be retained.
  – Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
  – Software on client PC must be uninstalled before transferring.

1.2 Disposal of the Server and Consumables

- Dispose of the server, hard disk drives, DVD/CD-ROMs, option board, and battery according to laws and regulations of the central and/or local government. Also dispose of the power cord attached to this product together with the server to prevent diversion to other products.

Note

- For disposal (or replacement) of the battery on the mother board of the server, consult with your sales representative.
- It is the user's responsibility to completely erase all data stored on storage devices such as hard disk drives, backup data cartridges, or any other media (such as CD-R/CD-RW) so that the data cannot be restored by a third party.

- Some components including fans, batteries, and the optical disk drive work for a limited period of time and require replacement. For stable operation of the server, NEC recommends you regularly replace these components. Contact your sales representative for information on replacement or the lifetime of components.

1.3 Regarding the Transportation of This Server

This server and/or some of the associated optional devices uses lithium metal batteries or lithium ion batteries. **Regulations for air/ocean transportation apply when transporting lithium batteries.** Conform to the regulations if you want to transport this server or optional devices by air or ship.

1.4 Moving and Storing

Follow the steps below when you move or store this server.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not disassemble, repair, or alter the server.**
- **Do not remove the lithium battery, NiMH, or Li-ion battery.**
- **Disconnect the power plug before installing or removing the server.**

-

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **Be careful of handling internal components that may be at high temperatures.**

Note

- **If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact your service representative.**
- If the server has hard disk drives, move the server while being careful not to damage the drive.
- When storing the server, monitor the environmental conditions of the storage area (temperature: –10°C to 55°C, humidity: 20% to 80%). (No dew condensation is permitted)

Tips

Make backup copies of important data stored in the hard disk drive.

1. Remove the media from the optical disk drive
2. Power off the server (POWER LED goes off)
3. Unplug the power cord of the server from the power outlet.
4. Disconnect all the cables from the server
5. Pack the server securely to protect from damage, shock, and vibration.

Important

If this server and internal optional devices are suddenly moved from a cold place to a warm place, condensation will occur and cause malfunctions and failures when these are used in such state. Wait for a sufficient period of time before using the server and other components in the operating environment.

Note

- Check and adjust the system clock before operating after relocating or storing the server.
- If the system clock time is significantly delayed or advanced over time in spite of adjustment, contact your sales representative.

2. Daily Maintenance

To use this server under top conditions at all times, periodically check and perform maintenance as follows. If abnormalities are found, ask your sales representative, avoiding impossible operation.

2.1 Checking and Applying Updates

Express5800 Series posts update information for BIOS, FW (firmware), driver, and others of the server and peripheral devices on our website. We recommend that the latest update always be applied for stable system.

NEC corporate site: **http://www.nec.com/**

[Support & Downloads]

NEC also provides *ExpressUpdate* that supports the detection, download, and application of the updates that must be applied to BIOS and FW (firmware) of the server.

ExpressUpdate is contained in EXPRESSBUILDER provided with the server.

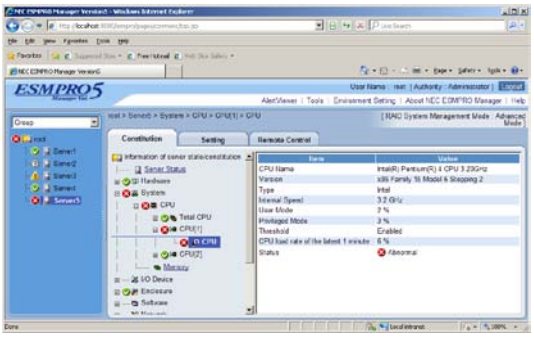
Tips

- Download and apply the latest update yourself.
- NEC recommends that you back up data for a rainy day before applying the latest update.

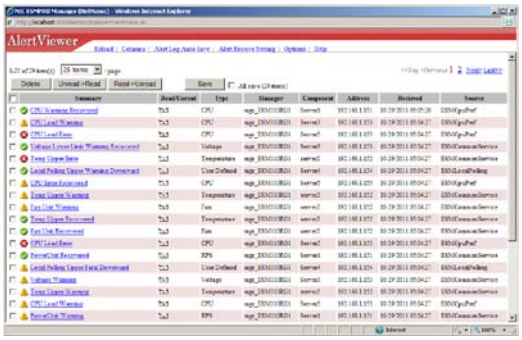
2.2 Checking Alerts

Use NEC ESMPRO Manager (for Windows) to constantly verify that no abnormalities are discovered on the monitored server and that no alerts have been issued.

Example image of NEC ESMPRO Manager



NEC ESMPRO Manager



AlertViewer

2.3 Checking STATUS LED

After powering on the server or before shutting down the system and powering off the server, check STATUS LED on the front of the server. For the functions and descriptions of the LED, refer to *Chapter 1 (5. Names and Functions of Parts)* in "*User's Guide*". If the indicator shows the server abnormality, contact your salses representative.

2.4 Backup

We recommend that you periodically back up the data on HDD.

If RAID System has been setup on your system, back up RAID Configuration Data. We also recommend that you back up it after a rebuilt required due to HDD failure. For information on RAID Configuration Data backup, refer to the utility offered by EXPRESSBUILDER in *Chapter 2 (5. Details of EXPRESSBUILDER)*.

2.5 Cleaning

Regularly clean the server to keep it in good condition.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not disassemble, repair, or alter the server.**
- **Disconnect the power plug before cleaning the server.**

2.5.1 Cleaning the server

Wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces.

Important

- **Do not use volatile solvents such as thinner and benzene to clean the server. Those solvents could damage or tarnish the material.**
- **The power outlet, cables, connectors on the rear panel of the server, and the inside of the server must be kept dry.**

1. Confirm that the power is OFF (POWER LED is OFF)
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in step 4.
6. Soak a soft cloth in water, squeeze it firmly, and wipe the server with it once again.
7. Wipe the server with a dry cloth.

2.5.2 Cleaning the tape drive

A dirty tape drive head causes unsuccessful file backup and damages the tape cartridge. Periodically clean the tape drive with the designated cleaning tape.

For the cleaning interval and method, the estimated usable period and lifetime of the tape cartridge, refer to the instructions attached to the tape drive.

2.5.3 Cleaning the keyboard and mouse

Wipe the surface of the keyboard with a dry cloth after confirming that the whole system, including the server and the peripherals, are shut down and POWER LED is off.

An optical mouse does not work properly if the lens area is not clean. Wipe the sensor with a dry cloth to remove any dirt or dust.

3. User Support

Before getting after-sales service, check the contents of the warranty and service.

3.1 Maintenance Services

Service representatives from NEC subsidiary companies or companies authorized by NEC provide maintenance services. For the services, contact your sales representative.

3.2 Before Asking for Repair

If you think that a failure occurred, follow the steps below:

1. Check if the power cord and cables to other products are properly connected.
2. Refer to *Chapter 1 (5. Troubleshooting)*. If you find a symptom similar to your problem, take the action as instructed.
3. Confirm that the required software has been properly installed.
4. Scan for viruses using a commercial Antivirus Software.

If the problem persists after taking the measures above, contact your sales representative. Take notes on LED indications and the display on the screen at the failure, which will be useful information for the repair.

For repair within the warranty period, be sure to apply with your warranty.

4. Collecting Failure Information

If the server is broken, you can collect failure information by using the following method.
The failure information to be described is to be collected only at the request of your sales representative.

Important **When the system restarts after a failure has occurred, a message may appear indicating virtual memory shortage. Ignore this message and proceed with starting the system. Restarting the system may result in an inability to properly dump the data.**

4.1 Collecting Event Logs

Collection for various event logs that occurred on the server follows the steps below.

Tips If a STOP error, system error, or stall occurs, restart the system and then follow the steps below.

4.1.1 Windows Server 2008 R2 / Windows Server 2008

1. Select **Administrative Tool** and then **Event Viewer** from **Control Panel**.
2. Select the type of log in **Windows Logs**.
   Application records events related to running applications.
   Security records events related to security.
   System records events that occur in Windows system components.
3. Select **Save All Event As...** from **Action** menu.
4. Enter the file name of the archived log in **File name**.
5. Select the type of the log file you want to save in **Save as type**, and then click [Save].

4.1.2 Windows Server 2003 R2 x64 Edition / Windows Server 2003

1. Select **Administrative Tool** and then **Event Viewer** from **Control Panel**.
2. Select the type of log to collect.
   Application records events related to running applications.
   Security records events related to security.
   System records events that occur in Windows system components.
3. Select **Save All Event As...** from **Action** menu.
4. Enter the file name of the archived log in **File name**.
5. Select the type of the log file you want to save in **Save as type**, and then click [Save].

For more information, refer to Windows Online Help.

4.2 Collecting Configuration Information

This section describes how to collect information on hardware configuration and internal specifications.

Tips If a STOP error, system error, or stall occurs, restart the system and then follow the procedure below.

1. Select **Run** from **Start** menu.
2. Enter `msinfo32.exe` in **Open** text box, and then click [OK].
3. **System Information** starts.
4. From **Files** menu, click **Export**.
5. Enter the file name to save in **File Name**, and then Click [Save].

4.3 Collecting User-Mode Process Dump (Dr. Watson Diagnostic Information)

Dr. Watson collects diagnostic information related to application errors.

For details, refer to *Chapter 1 (7.2 How to Create a User-Mode Process Dump File)* in "*Installation Guide (Windows)*".

4.4 Collecting Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information. You can specify any location for saving the diagnostic information. For details, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".

Consult with your sales representative before dumping the memory. Dumping the memory while the server is in operating normally may affect the system operation.

Important **A message indicating insufficient virtual memory may appear when restarting the system due to an error. Ignore this message and proceed. Restarting the system may result in an inability to properly dump the data.**

5. Troubleshooting

If this system does not operate as intended, check it according to the contents of the following checklist before sending it for repair. If an item in the checklist corresponds with a problem you are experiencing, follow the subsequent check and processing instructions.

If the system still does not operate normally, write down the messages displayed on the screen and then contact the maintenance service company.

5.1 Upon Power On to the End of POST

[?] **Fail to power on the server**

☐ Is the server properly supplied with power?

→ Check if the power cord connects to the power outlet (or UPS) that meets the power specifications for the server.

→ Use the power cord that comes with the server. Additionally, check the power cord for broken shield or bent plugs.

→ Make sure the power breaker for the connected power outlet is on.

→ If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. Refer to the manual that comes with the UPS for details.

Power supply to the server may be linked with UPS using the BIOS Setup utility.

☐ Did you press the power switch?

→ Press the power switch on the front of the server to turn on the power (the POWER LED ON).

→ When power cord is connected, the initialization of management controller starts. During initialization, the POWER LED lights amber, and the Power switch is disabled even if it is pressed to power on the server. To power on the server, press the POWER switch after the amber POWER LED is unlit.

☐ Is Standby Power Save set to **Enable** in the BIOS setup?

→ When Standby Power Save is enabled, remote power on is not allowed, and you can power on the server only by using the power switch on the server. If you change the AC Link setting while Standby Power Save is enabled, you need to press the power switch twice to start up the server.

[?] **The screen does not turn on.**

☐ Wait until the NEC logo appears.

[?] **POST does not complete**

☐ Is memory installed correctly?

→ Check if memory is installed correctly.

☐ Is the memory size large?

→ The memory check may take longer than usual if the installed memory size is large. Wait for a while.

☐ Did you perform any keyboard or mouse operation immediately after you started the server?

→ If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops processing. In such a case, reboot the server. Do not perform any keyboard or mouse operation until the BIOS start-up message appears after you reboot the server.

☐ Are memory and PCI devices supported for use with this server?

→ Operation of the server with unauthorized devices is not guaranteed.

5.2 Upon Starting EXPRESSBUILDER

[?] **Unable to start EXPRESSBUILDER**

☐ Did you insert EXPRESSBUILDER DVD and reboot while POST was being executed?

→ If you fail to insert EXPRESSBUILDER DVD and reboot during POST execution, an error message may appear or the OS may start up.

☐ Are BIOS settings correct?

→ BIOS Setup Utility allows you to configure the boot order of the boot devices. Configure the boot order so that the optical disk drive will be the first to start up.
(Check menu: **Boot**)

☐ Is a message such as the following displayed?

Message	Solution
This EXPRESSBUILDER version is not designed for this computer. Insert the correct version and click [OK].	Execute EXPRESSBUILDER provided with the server.
EXPRESSBUILDER could not get the hardware parameters of this motherboard. This version is not designed for this computer or the motherboard may be broken.	Contact your sales representative.
The file that EXPRESSBUILDER tried to operate was not found.	EXPRESSBUILDER cannot be read. Media may be defective or the optical disk drive may be faulty. Contact the maintenance service company.
The file that EXPRESSBUILDER tried to operate was not able to open.	
EXPRESSBUILDER can not get the parameters of the definition file.	
An undefined error occurred.	Contact your sales representative.

[?] **Unable to start EXPRESSBUILDER from Internal Flash Memory**

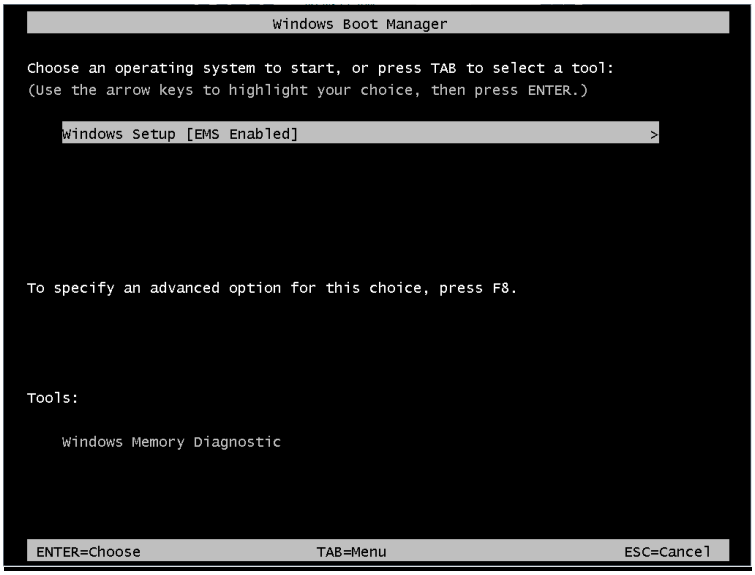
☐ Did you press <F3> key to start EXPRESSBUILDER from Internal Flash Memory while POST was being executed?

→ When the following message, "Press <F2> Setup, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network", appears on screen after starting up, press <F3> to start EXPRESSBUILDER from Internal Flash Memory.

☐ Is there a message, "<F3> Internal Flash Memory", displayed on POST screen?

→ If not, make sure that Internal Flash Memory is connected correctly by referring to *Chapter 2 (5. Details of EXPRESSBUILDER)*.

[?] **The following message appears and EXPRESSBUILDER failed to start.**


Windows Boot Manager
Choose an operating system to start, or press TAB to select a tool:
(Use the arrow keys to highlight your choice, then press ENTER.)
Windows Setup [EMS Enabled]
To specify an advanced option for this choice, press F8.
Tools:
Windows Memory Diagnostic
ENTER=Choose
TAB=Menu
ESC=Cancel

☐ Did you press <Enter> key consecutively twice or more when selecting "Os installation *** default ***"?

→ This error occurs if the <Enter> key is pressed twice of more at a short interval.

Press the <Enter> key while selecting "Windows Setup [EMS Enabled]".

The EXPRESSBUILDER starts.

5.3 Upon Installing OS

[?] **Unable to install OS**

☐ Is the Hard Disk Drive properly installed?

→ Make sure that the Hard Disk Drive is installed securely and that cables are properly connected.

☐ Did you configure the RAID Controller?

→ For the RAID System, use EXPRESSBUILDER or a RAID Configuration Utility (WebBIOS) to properly configure the RAID Controller before installing OS.

☐ Did you create a Logical Drive?

→ For the RAID System, create a Logical Drive using EXPRESSBUILDER or a RAID Configration Utility (WebBIOS) to install OS.

[?] **Unable to install Windows**

☐ Have you checked precautions for installation?

→ For Windows Server 2003, refer to "*Installation Guide (Windows)*".

[?] **A garbled message appears on the text-based setup screen during Windows installation and Windows installation cannot be continued**

☐ Are several Hard Disk Drives connected? Or did you try to install Windows with the several Logical Drives created under the RAID Controller?

→ Remove the Hard Disk Drives other than the Hard Disk Drive on which to install the OS once and then install Windows.

→ If you want to install Windows on a disk under the RAID Controller, install the OS using the EXPRESSBUILDER DVD. If important data is still on a Logical Drive, be sure to make a backup copy of it before installation. If you want to create several Logical Drives, create additional Logical Drives with the RAID System configuration utility after installing Windows.

[?] **While installing OS on Windows Server 2003 x64 Edition or Windows Server 2003, a driver list of the OEM drivers is not displayed**

☐ Did you change the boot priority in the Flash FDD?

→ Start the BIOS setup utility, and change the boot priority in the Flash FDD as follows.

Boot - **Floppy Drive BBS priorities** - **Boot Option #1** - **Flash FDD**

[?] **A product key was not requested**

☐ For Windows Server 2008 R2/Windows Server 2008

→ If you install using the backup DVD-ROM, entering the product key is not required. If installing using a DVD-ROM other than the backup DVD-ROM, a screen for entering the product key is displayed twice, during OS installation, and, before the MICROSOFT SOFTWARE LICENSE TERMS dialog box, which displays after OS installation. Follow the on-screen instructions to enter the product key.

[?] **The following devices are indicated as faulty devices in a Windows Server 2008 R2 Server Core installation environment**

- SM Bus Controller
- PCI Simple Communications Controller
- Base System Device
- System Interrupt Controller
- Performance Controller

→ There is no operational problem.

[?] **Unable to access the partition which was previously created after reinstalling while several disks are connected**

→ For details, refer to the Microsoft website below:

http://support.microsoft.com/kb/2497048/ja (Japanese only)

[?] **When Windows Server 2008 R2 is installed while several disks are connected, the system partition and the boot partition (100 MB) are sometimes created in another disk**

→ For details, refer to the Microsoft website below:

http://support.microsoft.com/kb/2530901/ja (Japanese only)

[?] **When Starter Pack is executed on Windows Server 2008 R2, the below message is sometimes displayed for a moment upon shutdown**

```
1 program still needs to close:
(Waiting for) Task Host Window
```

→ No problems for system operation.

For details, refer to the Microsoft website below:

http://support.microsoft.com/kb/975777/en-us

[?] **Windows Server 2003 R2 DISC 2 was installed after the Windows Server 2003 Service Pack had been applied**

→ Reapply the Service Pack. If you applied the Service Pack even once after installing Windows Server 2003 R2 DISC 2, you need not reapply it.

* If the Service Pack application is unknown when you install Windows Server 2003 R2 DISC 2, NEC recommends that the Service Pack be reapplied.

[?] **The system was installed as Workgroup although it is set to join the domain**

☐ Is the LAN cable properly connected?

→ If the LAN cable is not connected, the system is installed in workgroup setting, not in domain join setting. After the OS is started, join the domain.

[?] **The following features are installed when Windows Server 2008 R2/Windows Server 2008 IIS is installed using EXPRESSBUILDER**

☐ Windows Process Activation Service
- Process Model
- Configuration APIs

☐ Remote Server Administration Tool
- Role Administration Tools
- Web Server (IIS) Tools

→ The features listed above are activated because they are required for the installation of IIS basic features.

[?] **The Telnet Service is not installed**

→ Adjust the computer name to 14 characters or less, and then install the Telnet Service according to the following procedure:

How to install the Telnet Service

(1) Click **Run** on **Start** menu.

(2) Enter `tlntsvr/service` in the **Open** box, and then click [OK].

(3) Click **Start** menu, point to **Control Panel,** click **Administrative Tools**, and then click **Services** to confirm whether the Telnet Service is registered.

* When the installation of Telnet Service is finished, there is no problem if the computer name is set to 15 characters or more.

[?] **Fails to execute "Create a parameter file for Windows OS"**

→ **"Create a parameter file for Windows OS"** must be run using Microsoft® HTML Application host. If it does not start, associate the file type with Microsoft® HTML Application host via the following process.

(1) Select **Run** in **Windows Start** menu.

(2) Enter `%windir%\system32\mshta.exe/register`.

5.4 When OS is Started

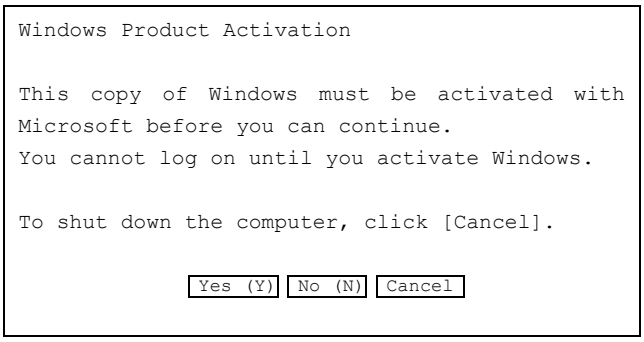
[?] **Unable to start OS**

- ☐ Has the BIOS configuration of the RAID Controller changed?
  - → Set the correct BIOS configuration with a RAID Configuration Utility (WebBIOS).
- ☐ Is the RAID Controller recognized by POST?
  - → Turn on the power after the RAID Controller is recognized as being connected successfully.
  - → If the RAID Controller is not recognized as being connected successfully, the RAID Controller may be faulty. Contact the maintenance service company with which you signed up or the dealer where you purchased the product.
- ☐ Is RAID Controller installed firmly straight into the PCI slot?
  - → Install the RAID Controller properly.
- ☐ Is the RAID Controller mounted on the PCI slot for which the mounting is restricted?
  - → Check the mounting restrictions of the server and then mount the RAID Controller on the correct slot.
    If the RAID Controller is not recognized as connected although the above action has been taken, the RAID Controller may be faulty. Contact the maintenance service company with which you signed up or the dealer where you purchased the product.
- ☐ Are Hard Disk Drives properly installed?
  - → Install Hard Disk Drives properly.
- ☐ Is SAS cable connected to Hard Disk Drive correctly?
  - → Connect the SAS cable properly.
    If the SAS cable is not recognized as connected although the above action has been taken, the Hard Disk Drive may be faulty. Contact the maintenance company with which you signed up or the dealer where you purchased the product.
- ☐ Is the EXPRESSBUILDER DVD inserted?
  - → Eject the EXPRESSBUILDER DVD and reboot.
- ☐ Is a cartridge inserted into N8151-86 with built-in RDX (USB)?
  - → Either remove the cartridge or change the boot order in BIOS Setup.
- ☐ Is Disk Array unit connected to the PCI card?
  - → Change the boot device configuration from HDD Drive BBS Priorities of the BIOS Setup Boot menu.

[?] **OS does not start with the /3GB switch**

→ In Windows Server 2003 x86, system often fails to start the OS with the /3GB switch.
In this case, please adjust the capacity of the user mode area using the /userva switch in reference to the following URL.
http://support.microsoft.com/kb/316739/en-us

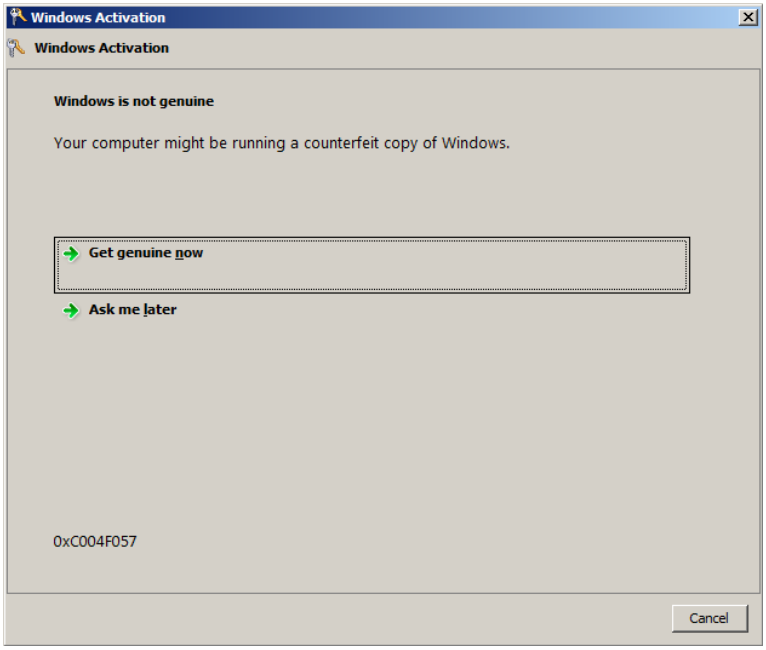
[?] **The system displays the message below and fails to log on:**


Windows Product Activation
This copy of Windows must be activated with Microsoft before you can continue.
You cannot log on until you activate Windows.
To shut down the computer, click [Cancel].
Yes (Y)
No (N)
Cancel

☐ Is the Windows product license authentication procedure completed?

→ In Windows Server 2003, the above message will be displayed if you use the operating system without executing the license authentication. Select [Yes], and execute the procedure for license authentication.

[?] **The following message appears when logging in the system on Windows Server 2008 R2 or Windows Server 2008:**



☐ Have you finished license authentication for Windows product?

→ The above message will appear if you use Windows Server 2008 R2 or Windows Server 2008 with the unauthenticated license.

Select [Get genuine now] and proceed license authentication.

The above message is an example of request for license authentication. The message displayed on screen may differ from this depending on the license.

5.5 When STOP Error Occurs

[?] **Cannot turn the power OFF at the blue screen (STOP error screen)**

→ If you want to turn off the power at the blue screen, execute forced shutdown (continue to press the power switch for 4 seconds). If you press the switch briefly instead of holding it, the server will not power off.

5.6 When Operating a RAID System

[?] **Unable to rebuild Hard Disk Drive**

☐ Is the capacity of the Hard Disk Drive to be rebuilt enough?

→ Use a Hard Disk Drive with the same capacity as that of the faulty Hard Disk Drive.

☐ Is the Logical Drive RAID0?

→ RAID0 cannot be rebuilt because it has no redundancy. Replace the failed Hard Disk Drive, recreate the configuration information, initialize it, and recover the drive using backup data.

[?] **Fails to automatically rebuild the Hard Disk Drive**

☐ Did you secure sufficient time for replacing the Hard Disk Drive (hot swap)?

→ To make auto-rebuild work, secure at least 90 seconds from when a Hard Disk Drive is removed to when the drive is installed.

[?] **The Hard Disk Drive failed**

→ Contact the maintenance service company with which you signed up or the dealer where you purchased the product.

[?] **Unable to perform Consistency Check**

☐ Is the Logical Drive **Critical** or **Degraded**?

→ Replace the failed Hard Disk Drive with new one, and then perform Rebuild.

☐ Is the Logical Drive RAID0?

→ RAID0 has no data redundancy, and therefore, Consistency Check is disabled in the RAID0 configuration.

[?] **Cannot set Write-Back for Cache Mode**

→ On **Virtual Disks** – **Properties** – **Policies** screen of Web BIOS, **Default Write** shows set value of cache mode of RAID Controller, and **Current Write** shows the current write policy. Accordingly, if battery is not connected, failed, or insufficiently charged, indication of **Current Write** changes to **Write Through** even if you specify **Write Back with BBU** for **Default Write**.

Indication of Reason for Diff in Write	Action
BBU not installed	Displayed when battery is disconnected. (1) Check if battery control cable (cable used to connect RAID Controller with battery) is properly connected. → Connect cable properly. (2) Is it displayed immediately after the battery was connected? → The battery may not be detected if it is insufficiently charged. If the battery is not detected even after 24 hours have elapsed, restart the server.
BBU is failed	Displayed when battery is failed. Contact your sales representative.
BBU is discharged	Displayed when battery voltage is low. Check the cache mode (current value) about 12 hours later.
BBU in re-learn cycle	Displayed when battery is being refreshed. Check cache mode (current value) about 12 hours later.
Reconstruction	Displayed when battery is being reconstructed. Check cache mode (current value) after reconstruction completes.

If the battery is not detected in spite of actions taken, the battery may be faulty.
Consult with your sales representative.

[?] **Additional battery is not recognized or the following message is displayed in POST**

```
The battery hardware is missing or malfunctioning,
or the battery is unplugged, or the battery could be
fully discharged. If you continue to boot the system,
the battery-backed cache will not function.
If battery is connected and has been allowed to charge
for 30 minutes and this message continues to appear,
then contact technical support for assistance.
Press 'D' to disable this warning (if your controller
does not have a battery.
```

☐ Are the cable between the battery pack and battery board and the control cable between the battery board and battery connector connected correctly?

→ Connect the cables correctly.

☐ Is this message displayed after the battery is connected?

→ If the battery charging status is low, the battery may not be recognized. If the battery is not recognized although 24 hours has passed, restart the system once.

If the battery is not recognized although the above action has been taken, the additional battery may be faulty. Contact the maintenance service company with which you signed up or the dealer where you purchased the product.

[?] **Event ID129: The following message appears on Windows Event Log**

```
Event source  :  megasas2
Event ID      :  129
Type          :  Warning
Description   :  Information about Event ID (129) (Source: megasas2) is not found.
                 (The rest is skipped.)
```

→ Retry by OS has succeeded. It is not the problem in operating the system.

[?] **Event ID510: The following event to prompt battery refresh is logged if additionally battery for RAID Controller has not been refreshed for about 1 year from beginning of use. (W, X: Number of RAID Controller)**

```
Event source  :  raidsrv
Event ID      :  510
Type          :  Info
Description   :  [CTRL: W (ID=X)]
                 Battery needs to be refreshed.
```

→ Additional battery for RAID Controller is not refreshed automatically except for the first time. However, it is recommended to perform battery refresh once a year as guideline for stable operation of battery. Use Universal RAID Utility to perform battery refresh manually. Refer to *Universal RAID Utility User's Guide* stored in EXPRESSBUILDER for more information.

[?] **DISK LED flashes**

☐ DISK LED flashes frequently even while the Hard Disk Drive is not accessed.

→ When Patrol Read is running, the DISK LED flashes even if the Hard Disk Drive is not being accessed. If SATA Hard Disk Drive is used, the DISK LED may stay on.

[?] **When N8190-153/154 is used, the names of the Fibre Channel controllers may appear with different names on Device Manager**

☐ When N8190-153/154 is used in Windows Server 2008 R2 or Windows Server 2008, a different controller name may be displayed per controller in Device Manager. It is not a problem in operating the system.
To display correct controller name, run the following command stored in the EXPRESSBUILDER DVD and reboot the system.

Windows Server 2008 R2/Windows Server 2008 x64 Edition:
EXPRESSBUILDER DVD:\021\win\winnt\ws2008x64\elxstor\friendlyname.exe

Windows Server 2008:
EXPRESSBUILDER DVD:\021\win\winnt\ws2008\elxstor\friendlyname.exe

5.7 When Using Internal Devices and Other Hardware

[?] **Fail to access the internal or external devices (or such devices fail to operate)**

☐ Are cables properly connected?

→ Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

☐ Is the power-on order correct?

→ When the server has any external devices connected, power on the external devices first, then the server.

☐ Did you install drivers for connected optional devices?

→ Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

☐ Is option board setting correct?

→ Usually, no PCI device settings need to be changed. However, depending on the board to be set, special setting may be required. Refer to the manual that comes with the board for details to make correct settings.

→ Some devices connected to the serial or parallel port, or USB port may require I/O port address or operation mode settings. Refer to the manual that comes with the device to make correct settings.

[?] **The keyboard or mouse does not work**

☐ Is the cable properly connected?

→ Make sure that the cable is connected to the connector on the front or rear of the server.

☐ Is BIOS configuration correct?

→ You can use the BIOS setup utility to change the keyboard feature. Check the BIOS configuration with this utility.

☐ Are the server drivers installed?

→ Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to the manual to check that the keyboard and mouse settings are correct.

[?] **Unable to access the Hard Disk Drive**

☐ Is the Hard Disk Drive supported by the server?

→ Operation of any device that is not authorized by NEC is not guaranteed.

☐ Is the Hard Disk Drive properly installed?

→ Check the Hard Disk Drive installation status and the cable connections.

[?] **Unable to access the (internal or external) SCSI devices**

☐ Is the SCSI device supported for use with the server?

→ Operation of any SCSI device that is not authorized by NEC is not guaranteed.

☐ Are the optional SCSI controllers properly configured?

→ If the optional SCSI controller board is installed and connecting SCSI devices, use the BIOS Setup utility to configure the SCSI devices correctly. For details, refer to the manual that comes with the optional SCSI controller board.

☐ Are SCSI devices settings correct?

→ If the server connects to external SCSI devices, SCSI ID and SCSI terminator need to be configured. For details, refer to the manual that comes with the SCSI devices.

5.8 When OS is in Operation

[?] **Windows operation is unstable**

☐ Have you installed the Starter Pack?

→ If the network driver is installed after OS is installed, Windows operation may become unstable. Install the Starter Pack by referring to the description about how to install the Starter Pack for each OS in "*Installation Guide (Windows)*".

[?] **After the system is restored from the backup tool, Windows is misbehaving**

→ Update the system by using EXPRESSBUILDER (refer to *Chapter 2 Installing the Bundled Software* in "*Installation Guide (Windows)*".

[?] **The system time lags**

→ In Windows Server 2008, if you do not use the server that adjusts time such as NTP (Network Time Protocol) Server, the system time may differ from actual time.
In this case, use NTP server or disable Windows Time Service.

[?] **Fails to be recognized on network**

☐ Is the cable connected properly?

→ Securely connect the proper cable to the network port on the rear of the server. Additionally, make sure that the cable conforms to the network interface standards.

☐ Are BIOS settings correct?

→ You can disable the internal network controller using the BIOS setup utility. Check the settings with BIOS setup utility.

☐ Have you completed protocol and services settings?

→ Verity that the network driver for the server network controller has been installed. Also verify that protocol such as TCP/IP or various services have been properly specified.

☐ Are transfer rate settings correct?

→ Verify that the transfer rate and duplex mode are the same as those of the connecting hubs.

[?] **Unable to display HELP on BACS**

→ HELP screen cannot be displayed on this BACS.
There is no problem in the quality or operation of network communications.

[?] **Communication performance of an optional LAN board is degraded**

→ NEC recommends that the value of Jumbo Packet be 4,000 bytes or less for N8104-128 if the settings of Flow Control are specified as anything other than Disabled.
If the value of Jumbo Packet is set larger than the recommended value, communication performance may be degraded.

[?] **There are RX dropped packets when the system was started on Linux**

→ Although there may be RX dropped packets when the system is started, there is no operational problem. Check the system and network environment when there are RX dropped packets during operation or when there is no communication.

5.9 When EXPRESSBUILDER is Started on Windows

[?] **Cannot read online documents**

☐ Do you have Adobe Reader installed correctly in your system?

→ Some documents are supplied in PDF format. To read PDF files, Adobe Reader needs to be installed in your computer.

☐ Is your browser Internet Explorer?

→ Internet Explorer sometimes displays the Information bar to enforce security. If this happens, click the Information bar to display the documents.

[?] **The menu does not appear**

☐ Is the shift key pressed?

→ Setting the DVD/CD with the shift key pressed down cancels the Autorun feature.

☐ Is the OS in the proper state?

→ The menu may not appear depending on the system registry setting or the timing to set the DVD/CD. In such a case, select **My Computer** from Explorer and double-click the icon of the set DVD drive.

[?] **Some menu items are grayed out**

☐ Is your system environment correct?

→ Some software requires administrator authority or needs to be operated on the server. Run on the appropriate environment.

5.10 For Bundled Software

[?] **NEC ESMPRO Agent (for Windows)**

→ For details of NEC ESMPRO Agent (for Windows), refer to "NEC ESMPRO Agent Installation Guide (Windows)" in EXPRESSBUILDER or its help.

[?] **NEC ESMPRO Manager**

→ For details of NEC ESMPRO Manager, refer to "NEC ESMPRO Manager Installation Guide" in EXPRESSBUILDER or its help.

5.11 For Optical Disk Drives

[?] **Unable to access or play optical disks such as CD-ROMs**

☐ Is the CD-ROM properly set in the optical disk drive tray?

→ There is a holder in the tray to secure the disk. Make sure that the disk is securely placed in the holder.

[?] **Unable to access or play DVD/CD-ROMs**

☐ Is the DVD/CD-ROM supported by the server?

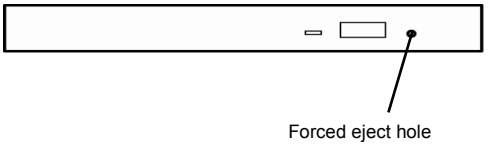
→ For a disk such as a CD with copy guard which does not conform to the CD standard, the playback of such a disk with the optical disk drive is not guaranteed.

→ The DVD/CD-ROM for Macintosh is not supported.

[?] **Unable to eject a disk using the eject button**

→ Eject the disk in the following procedure.

1. Press the power switch to turn off the server (POWER/SLEEP LED is off).
2. Use a 100 mm long metal pin that is 1.2 mm in diameter (or uncoil a thick paper clip) and insert it into the forced eject hole at the front of the tray. Keep pressing slowly until the tray comes out.



Important
- **Do not use anything that easily breaks such as toothpicks or plastic.**
- **If you still cannot eject the disk, contact the maintenance service company.**

3. Pull the tray out with your hands.
4. Remove the disk.
5. Push the tray back to its original position.

5.12 When Power Off

[?] **The power is not turned off**

☐ Is the suppression feature of the power switch enabled?

→ Restart the system once and start the BIOS setup utility.

The menu to be confirmed: **Server → Power Switch Inhibit**

6. Windows System Recovery

Recover the Windows system by following the instructions below if the files necessary to operate Windows are corrupt.

Note

- After recovering the system, be sure to install each driver and Starter Pack, referring to the descriptions about how to install Starter Pack and device driver in "*Installation Guide (Windows)*".
- If Hard Disk Drive cannot be recognized, you cannot recover the Windows system.
- Depending on the server configuration, you may be required to create copies of OEM drivers on removable media.

6.1 Recovery of Windows Server 2008 R2 and Windows Server 2008

If Windows does not start for some reason, you can recover Windows using the system recovery option. Be sure to perform this operation under the supervision of a user or administrator who has a thorough knowledge of this option. For details, refer to Windows Help.

When the OEM drivers are required, copy the files under the following designated folder in EXPRESSBUILDER to removable media.

- **Windows Server 2008 R2:** `\021\win\winnt\oemfd\ws2008r2`
- **Windows Server 2008 64-bit Edition:** `\021\win\winnt\oemfd\ws2008x64`
- **Windows Server 2008 32-bit Edition:** `\021\win\winnt\oemfd\ws2008`

6.2 Recovery of Windows Server 2003 R2 x64 Edition and Windows Server 2003

If Windows does not start for some reason, you can recover Windows using the recovery console. Be sure to perform this operation under the supervision of a user or administrator who has a thorough knowledge of this method. For details, refer to Windows Help.

When the OEM drivers are required, copy the files under the following designated folder in EXPRESSBUILDER to a Flash FDD.

- **Windows Server 2003 R2 x64 Edition:** `\021\win\winnt\oemfd\w2k3amd`
- **Windows Server 2003:** `\021\win\winnt\oemfd\dotnet`

7. Resetting and Clearing the Server

Refer to this section if the server does not work or if you want to set BIOS settings back to the factory settings.

7.1 Software Reset

If the server halts before starting the OS, press <Ctrl> + <Delete> + <Alt> keys. This clears all the data in progress in memory, and restarts the server.

Note To reset the server when it is not frozen, make sure that no processing is in progress

7.2 BMC Reset

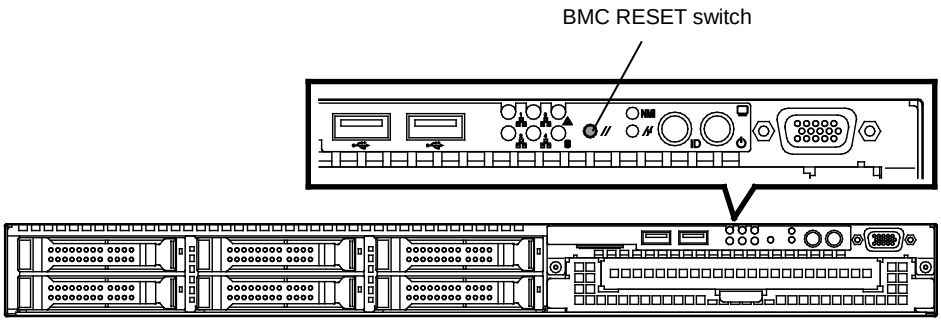
Press BMC RESET Switch only if a problem occurs in EXPRESSSCOPE Engine 3 (BMC).

Do not press BMC RESET Switch in usual operation.

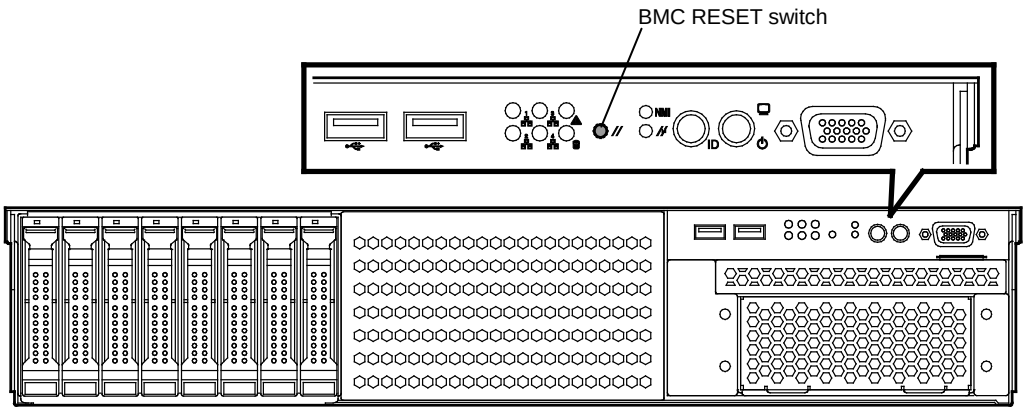
To reset the BMC, press BMC RESET Switch at least five seconds. Remote management feature is disabled for about 40 seconds after BMC is reset.

Tips BMC RESET Switch only resets BMC and that does not reboot the server.

R120d-1M



R120d-2M



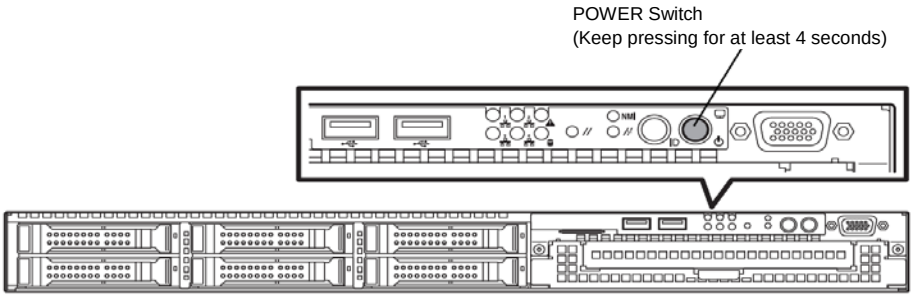
7.3 Forced Shutdown

Use this function when an OS command does not shut down the server, POWER Switch does not turn off the server, or software reset does not work.

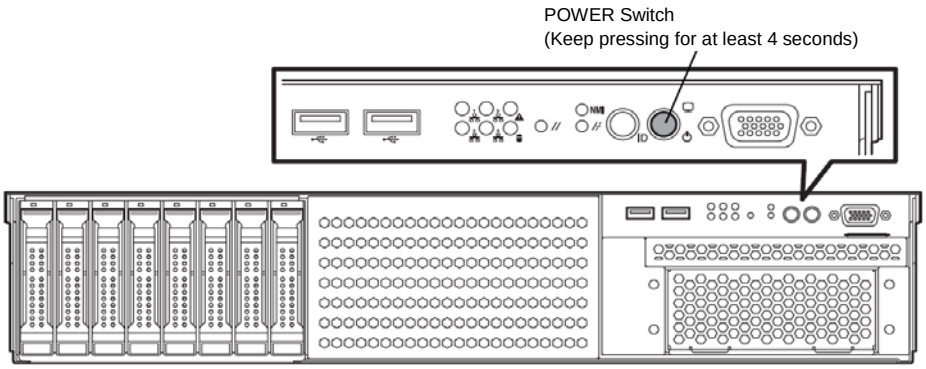
Continue to hold POWER Switch of the server for at least 4 seconds. The power is forcibly turned off. **(To turn on the power back again, wait at least 30 seconds after turning off the power).**

Note If the remote power-on function is used, cycle the power once to load the OS after the power has been forcibly turned off, and then turn off the power again by shutting down the OS.

R120d-1M



R120d-2M



7.4 Clearing BIOS Settings (CMOS Memory)

To set the BIOS settings back to the factory default settings (clearing CMOS memory), use the internal jumper switch.

You can also clear the password set in the BIOS Setup utility (SETUP) by using the same way.

Tips

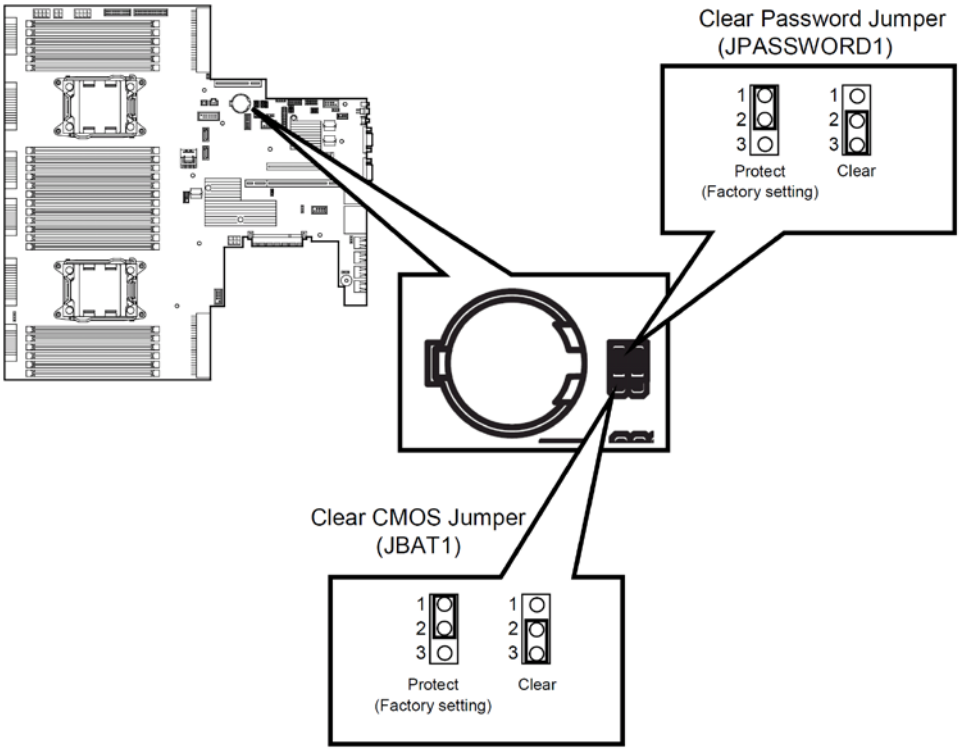
Use this function to return the BIOS settings to the factory defaults if the server does not work.

When the server works, use the BIOS setup utility (SETUP) to return the settings to the factory defaults.

To clear the password or the CMOS memory, use the corresponding jumper switch illustrated in the figure below.

Important

Do not change any other jumper switch settings. Any change may cause the server to fail or malfunction.



The following instructions show how to clear the CMOS memory and the password.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Do not disassemble, repair, or alter the server.**
- **Do not remove lithium, NiMH, or Li-ion batteries.**
- **Disconnect the power plug before installing or removing the server.**

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use* in "*User's Guide*".

- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **Avoid installing under extreme temperature conditions.**

Important **Take anti-static measures before operating the server. For detailed information on static electricity, refer to *Chapter 2 (1.2 Anti-static Measures)* in "*User's Guide*".**

- **Clearing CMOS memory**

1. Refer to "*Getting Started*" provided with this server or *Chapter 2 (1. Installing Internal Optional Devices)* in "*User's Guide*" to remove Top Cover.
2. Confirm the position of Clear CMOS Jumper.
3. Change jumper swtich settings.
4. Wait about 5 seconds and then put it back.
5. Close Top Cover.
6. Plug in the power cord and turn on the server.
7. POST halts with the following error message
   ERROR
   `8006: System configuration data cleared by Jumper.`
   `Press<F1> to resume, <F2> to Setup`
8. Press <F2> key to start the BIOS Setup utility, and then run **Load Setup Defaults** from **Save & Exit** menu.

- **Clearing a password**

  1. Refer to "*Getting Started*" provided with this server or *Chapter 2 (1. Installing Internal Optional Devices)* in "*User's Guide*" to remove Top Cover.
  2. Confirm the position of Clear Password Jumper.
  3. Change jumper swtich settings.
  4. Close Top Cover and press POWER Switch.
  5. POST halts with the following error message
     ERROR
     `8007: Password Cleared By Jumper.`
     `Press<F1> to resume, <F2> to Setup`
  6. Press <F2> key to start BIOS Setup Utility and then change the password. Next, execute [Save Changes and Exit].
  7. Turn off the power and return the jumper switch to its original position by following steps 1 and 2.
  8. Close Top Cover.

8. System Diagnostics

System Diagnostics runs several tests on the server.

From the **Tool menu** of EXPRESSBUILDER, select **Test and diagnostics** to diagnose the system.

8.1 Test Items

The following items are tested in System Diagnostics

- Memory
- CPU cache memory
- Hard disk drive

Important **When executing the system diagnostics, be sure to disconnect the LAN cable. Executing the system diagnostics with the LAN cable connected may affect the network.**

Tips On checking hard disk drives, no data is written to the disk.

8.2 Startup and Exit of System Diagnostics

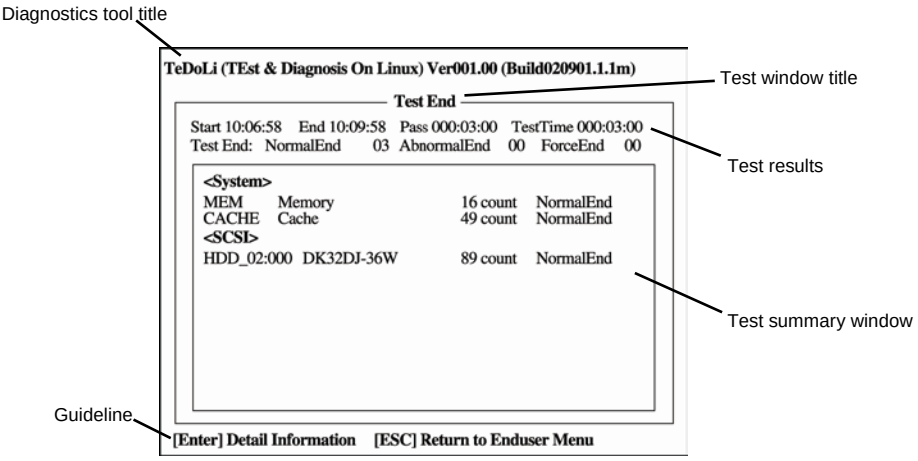
Start up System Diagnostics in the following procedure. (If the server is running, follow steps 1 to 4 after shutting down and the server is ready to be rebooted.)

1. Start up EXPRESSBUILDER and select **Tool menu**.
   For information on starting up EXPRESSBUILDER, refer to *Chapter 2 (5. Details of EXPRESSBUILDER)*.

   Note In case **Language Selection menu** appears, select **English**.

2. From the **Tool menu**, select **Test and diagnostics**.

   From **Test and diagnostics**, select **End-User Mode** to start System Diagnostics. This process takes about three minutes.
   When the diagnostics is completed, the screen display changes as shown below.



Diagnostics tool title
Shows the name and version of the diagnostic tool.

Test window title
Shows the progress of the diagnostics. “Test End” is displayed when the diagnostics completes.

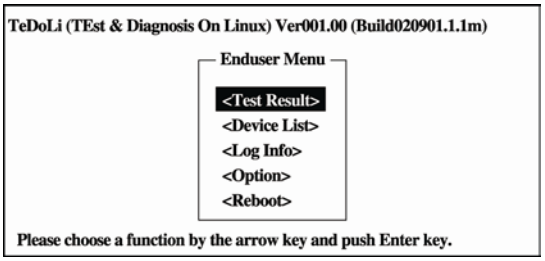
Test results
Shows the start, end, and elapsed time and completion status of the diagnostics.

Guideline
Shows the details of the keys to operate window.

Test summary window
Shows the results of each test that executed the diagnostics. Move the cursor and press <Enter> key on the cursor line to display the details of the test.

When an error is detected by the System Diagnostics, the relevant test result in the Test summary window is highlighted in red, and “Abnormal End” is displayed in the result on the right side.
Move the cursor to the test that detected the error, and press <Enter > key. Take notes about the error message that has been output to the Detail Information screen and contact the store where you purchased the product or your maintenance service company.

3. Follow the guideline shown at the bottom of the screen, and press <Esc> key.
   The **Enduser Menu** below is displayed.



<Test Result>
Shows the diagnostics completion screen of the above diagnostics.

<Device List>
Shows a list of connected devices.

<Log Info>
Shows the log information of the diagnostics. Log information can be saved.
To save it, connect a FAT formatted removable media, and then select [Save(F)].

<Option>
Optional features can be used from this menu.

<Reboot>
Reboots the hardware.

4. Select **Reboot** in **Enduser Menu**.
   The server restarts. Remove EXPRESSBUILDER DVD from the drive.

System Diagnostics is now completed.

9. Offline Tools

Offline tools are used for preventive maintenance, failure analysis, and their settings for this product.

9.1 Starting Offline Tools

Start up the offline tools at the following steps.

1. Turn on the peripheral devices and then the server.
2. Press <F4> key while the message below is displayed.
   `Press <F2> SETUP, <F3> Internal flash memory, <F4> ROM Utility, <F12> Network.`
3. Keyboard Selection Menu appears after POST completion.
   When you select a keyboard type, the following menu is displayed.

Off-line TOOL MENU
Maintenance Utility BMC Configuration Exit

4. Select **Maintenance Utility** or **BMC Configuration** to start each tool.

9.2 Functions of Offline Tools

Offline Tools offer the following functions.

Note When you start the offline tools while RDX is connected to the server, disable RDX before starting the offline tools by setting RDX to hibernate mode.

- **Off-line Maintenance Utility**

  Off-line Maintenance Utility is started when **Maintenance Utility** is selected. Off-line Maintenance Utility is used for preventive maintenance and failure analysis for this product. When you are unable to start NEC ESMPRO due to a failure, Off-line Maintenance Utility can be used to check the cause of the failure.

  Note The Off-line Maintenance Utility is intended for mainenance personnel. Consult with your service representative if a trouble that requires Off-line Maintenance Utility occurs.

  After starting up the Off-line Maintenance Utility, the following features are available to run.

  – IPMI Information Viewer

    Displays System Event Log (SEL), Sensor Data Record (SDR), and Field Replaceable Unit (FRU) in IPMI (Intelligent Platform Management Interface) and also back up such information.

    Using this feature, system errors and events can be investigated to locate the parts to be replaced. You can also clear the System Event Log (SEL) area, and specify the operation when the System Event Log (SEL) area becomes full.

  – System Information Viewer

    Displays information on processor (CPU), BIOS.

    Also output the information to a text file.

  – System Information Management

    Set the information specific to your server (Product information, Chassis information)

- **BMC Configuration**

  – It is used for setups of alert functions by BMC (Baseboard Management Controller) and remote control functions by PC for Management.

9.3 Console-less

Off-line Tools can be remotely controlled from PC for Management without requiring keyboard or other consoles to be connected.

9.3.1 How to remotely control

Control from a LAN connected PC for Management using the remote KVM of EXPRESSSCOPE Engine 3.

For details of the remote KVM, refer to "*EXPRESSSCOPE Engine 3 User's Guide*" in EXPRESSBUILDER.

Note Connect the LAN cable to the connector on management LAN port. Or, if Shared BMC LAN feature is used, connect the LAN cable to the corresponding LAN connector.

NEC Express5800 Series
Express5800/R120d-1M, R120d-2M

2 Convenient Features

This chapter describes convenient features for using the server. Refer to this chapter according to your purpose and need.

1. **System BIOS**
   Describes how to set the System BIOS settings and parameters.

2. **Flash FDD**
   Describes the Flash FDD.

3. **Power Control Features**
   Describes the power control feature.

4. **RAID System Configuration**
   Describes the RAID configuration utility installed in the server.

5. **Details of EXPRESSBUILDER**
   Describes the EXPRESSBUILDER attached to the server.

6. **EXPRESSSCOPE Engine 3**
   Describes EXPRESSSCOPE Engine 3.

7. **NEC ESMPRO**
   Describes NEC ESMPRO Agent and NEC ESMPRO Manager, applications to manage and monitor the server.

8. **Device Information Collection Utility**
   Describes the device information collection utility

9. **Universal RAID Utility**
   Describes Universal RAID Utility, an application to manage or monitor the RAID Controllers.

1. System BIOS

You can check and change the parameters using the BIOS Setup utility (SETUP).

1.1 Starting SETUP

Turn on the server and proceed with POST.

Wait until the following message appears at the bottom left of the screen.

```
Press <F2> SETUP, ...
```
(* a different message may appear depending on the environment)

If you press <F2>, SETUP will start after POST, and the Main menu appears. (You can also start SETUP by pressing <F2> key while expanding option ROM.)

1.2 Parameter Descriptions

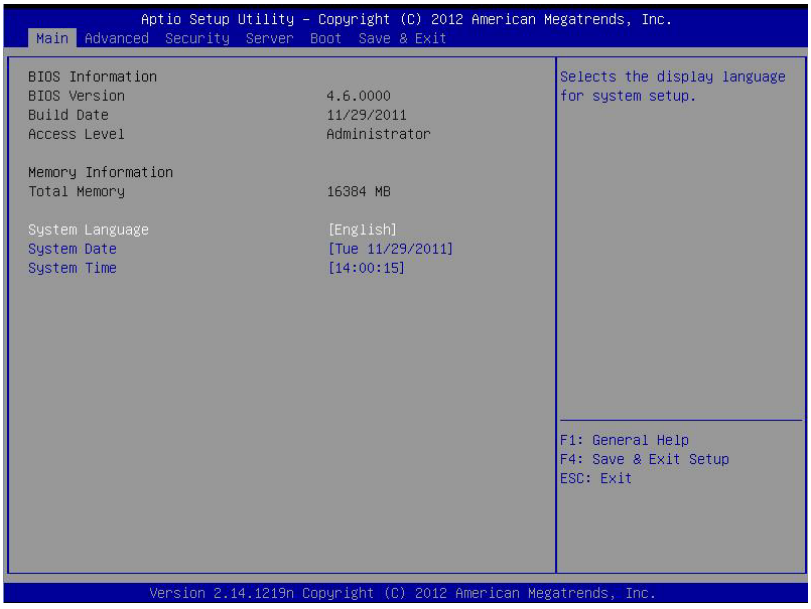
The SETUP utility has the following six major menus.

- Main menu
- Advanced menu
- Security menu
- Server menu
- Boot menu
- Save & Exit menu

These menu has submenus for relevant items. Selecting submenus allows you to configure further detailed parameters.

1.2.1 Main

If you start up the SETUP utility, the **Main** menu is displayed first.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
BIOS Information
BIOS Version 4.6.0000
Build Date 11/29/2011
Access Level Administrator
Memory Information
Total Memory 16384 MB
System Language [English]
System Date [Tue 11/29/2011]
System Time [14:00:15]
Selects the display language for system setup.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
BIOS Information	–	–
BIOS Version	–	The BIOS version is diaplyed (display only).
Build Date	MM/DD/YYYY	The BIOS build date is displayed (display only).
Access Level	[Administrator] User	The current access level (Administrator or User) is displayed (display only). If no password is set, **Administrator** is displayed.
Memory Information	–	–
Total Memory	–	The total capacity of installed memory is displayed (display only).
System Language	[English] Français Español Deutsch Italiano	Select a disaplay language for SETUP. If you run SETUP with **BIOS Redirection Port** enabled (other than **Disabled**), **English** is automatically selected. At that time, you cannot change setting of **System Language**. If **BIOS Redirection Port** is set to **Disabled**, the language set in this option is used at the next startup of SETUP, and you can change the language setting.
System Date	WWW MM/DD/YYYY	Set the system date.
System Time	HH:MM:SS	Set the system time

[ ]: Factory settings

Tips

Be sure to confirm that the date and time in the BIOS parameters are correctly configured. In any of the following situations, check the system time before using the server.

- After transporting the server
- After removing the server from storage
- After the server wakes up from hibernating in an environment out of the guaranteed operating range (temperature: 10°C to 35°C; humidity: 20% to 80%

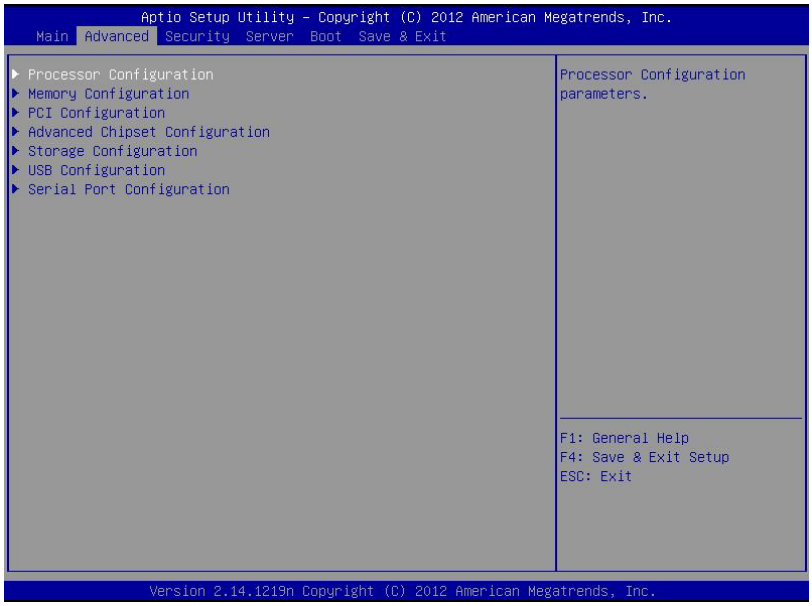
Check the system clock monthly. Additionally, if you implement the server in a system that requires highly accurate time, use of a time server (an NTP server) is recommended.

If the system time becomes considerably slow or fast over time even though you regularly adjust it, contact the dealer where you purchased the server or the maintenance service company for maintenance.

1.2.2 Advanced

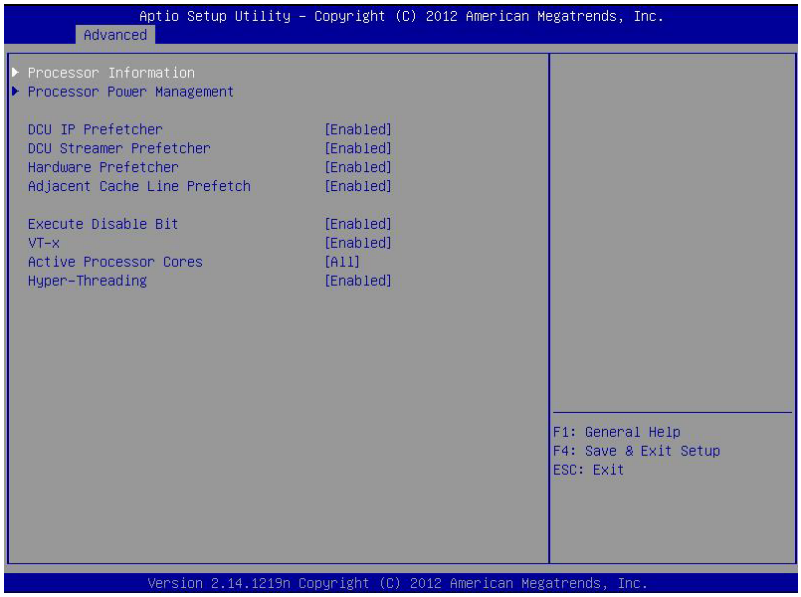
If you move the cursor to **Advanced**, the **Advanced** menu appears.

For the menus that show a "▶" to their left, select a menu and press the <Enter> key to display its submenu.



(1) Processor Configuration submenu

From the **Advanced** menu, select **Processor Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

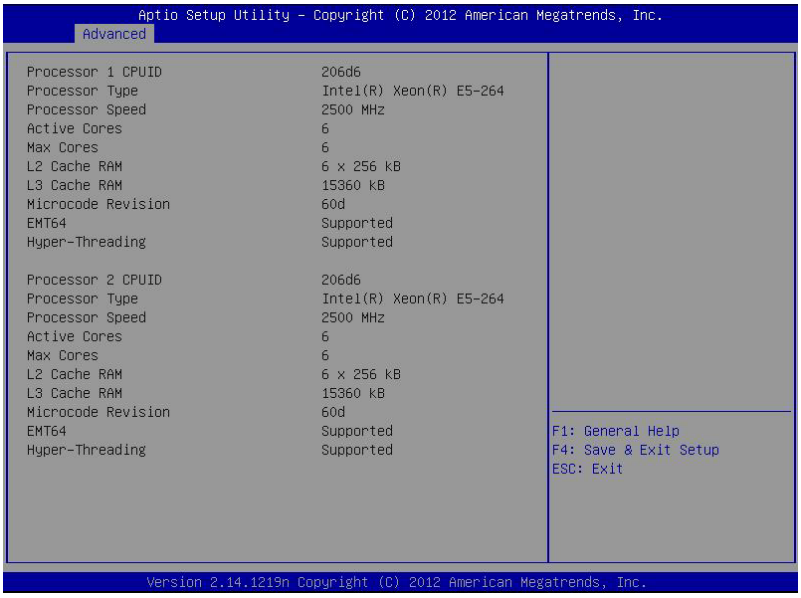


For details about the options, see the table below.

Option	Parameter	Descriptions
Processor Information	–	–
Processor Power Management	–	–
DCU IP Prefetcher	Disabled [Enabled]	Enable or disable DCU IP Prefetcher of processor.
DCU Streamer Prefetcher	Disabled [Enabled]	Enable or disable DCU Streamer Prefetcher of processor.
Hardware Prefetcher	Disabled [Enabled]	Enable or disable Hardware Prefetcher
Adjacent Cache Line Prefech	Disabled [Enabled]	Set the optimal access from memory to cache to either Enabled or Disabled.
Execute Disabled Bit	Disabled [Enabled]	Enable or disable Execute Disable Bit feature. This option is displayed only when the installed processor supports this feature.
VT-x	Disabled [Enabled]	Enable or disable Intel Virtualization Technology (feature to virtualize processor).
Active Processor Cores	[All] 1-7	Specify the number of cores to enable in each processor package. The number of cores that can be specified depends on the processor installed.
Hyper-Threading	Disabled [Enabled]	Enable or disable the feature to execute two threads with only one core. This option is displayed only when the installed processor supports this feature.

[ ]: Factory settings

(a) Processor Information submenu

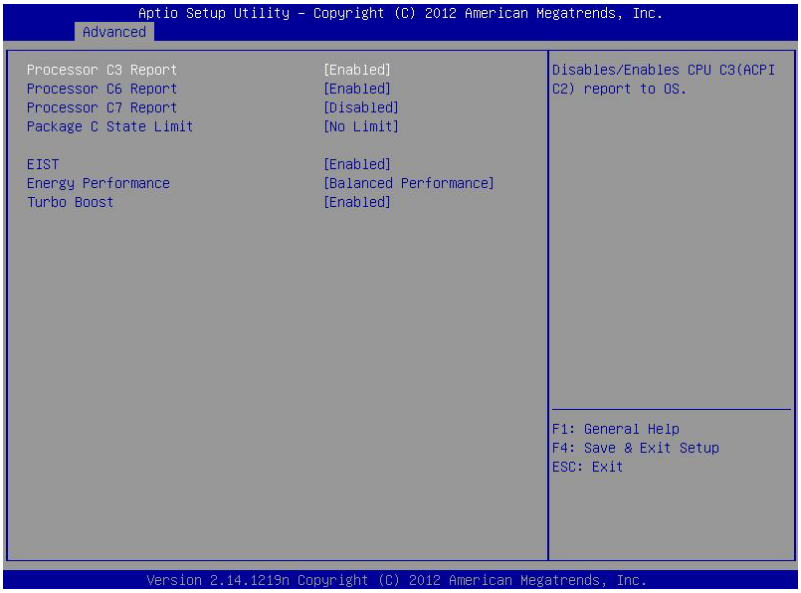

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Processor 1 CPUID 206d6
Processor Type Intel(R) Xeon(R) E5-264
Processor Speed 2500 MHz
Active Cores 6
Max Cores 6
L2 Cache RAM 6 x 256 kB
L3 Cache RAM 15360 kB
Microcode Revision 60d
EMT64 Supported
Hyper-Threading Supported
Processor 2 CPUID 206d6
Processor Type Intel(R) Xeon(R) E5-264
Processor Speed 2500 MHz
Active Cores 6
Max Cores 6
L2 Cache RAM 6 x 256 kB
L3 Cache RAM 15360 kB
Microcode Revision 60d
EMT64 Supported
Hyper-Threading Supported
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Processor 1 CPUID	Number	ID or Processor 1 is displayed by a numerical value.
Processor Type	–	Type of Processor 1 is displayed.
Processor Speed	–	Clock speed of Processor 1 is displayed.
Active Cores	–	The number of active cores in Processor 1 is displayed.
Max Cores	–	The maximum number of cores in Processor 1 is displayed.
L2 Cache RAM	–	The secondary cache size of Processor 1 is displayed.
L3 Cache RAM	–	The tertiary cache size of Processor 1 is displayed.
Microcode Revision	–	The revision of the microcode applied to Processor 1 is displayed.
EMT64	Supported Not Supported	Whether the Intel 64 architecture is supported on Processor 1 or not is displayed.
Hyper-Threading	Supported Not Supported	Whether the Hyper-Threading Technology is supported or not on Processor 1 is displayed.
Processor 2 CPUID	Number	ID or Processor 2 is displayed by a numerical value. "Note Installed" indicates that no processor is installed in processor socket 2.
Processor Type	–	Type of Processor 2 is displayed.
Processor Speed	–	Clock speed of Processor 2 is displayed.
Active Cores	–	The number of active cores in Processor 2 is displayed.
Max Cores	–	The maximum number of cores in Processor 2 is displayed.
L2 Cache RAM	–	The secondary cache size of Processor 2 is displayed.
L3 Cache RAM	–	The tertiary cache size of Processor 2 is displayed.
Microcode Revision	–	The revision of the microcode applied to Processor 2 is displayed.
EMT64	Supported Not Supported	Whether the Intel 64 architecture is supported on Processor 2 or not is displayed.
Hyper-Threading	Supported Not Supported	Whether the Hyper-Threading Technology is supported or not on Processor 2 is displayed.

[ ]: Factory setting

(b) Processor Power Management submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Processor C3 Report [Enabled]
Processor C6 Report [Enabled]
Processor C7 Report [Disabled]
Package C State Limit [No Limit]
EIST [Enabled]
Energy Performance [Balanced Performance]
Turbo Boost [Enabled]
Disables/Enables CPU C3(ACPI C2) report to OS.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

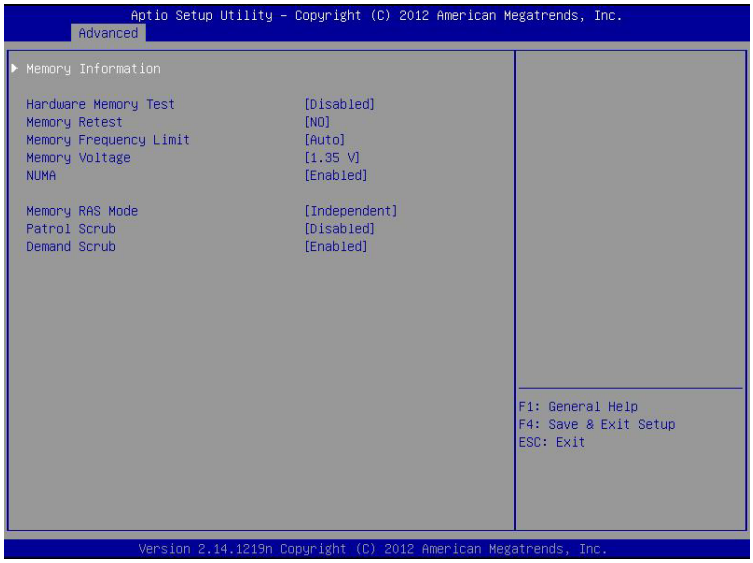
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Processor C3 Report	Disabled [Enabled]	Enable or disable the feature to report Processor C3 State to OS.
Processor C6 Report	Disabled [Enabled]	Enable or disable the feature to report Processor C6 State to OS.
Processor C7 Report	[Disabled] Enabled	Enable or disable the feature to report Processor C7 State to OS.
Package C State Limit	C0 C2 C6 [No Limit]	Specify the upper limit for Package C State of processor.
EIST	Disabled [Enabled]	Enable or disable the Enhanced Intel SpeedStep Technology feature. This option is displayed only when the installed processor supports this feature.
Energy Performance	Performance [Balanced Performance] Balanced Energy Energy Efficient	Specify whether the performance is preferred or energy-saving is preferred while processor is running.
Turbo Boost	Disabled [Enabled]	Enable or disable the Turbo Boost Technology feature. This option is displayed only when the installed processor supports this feature.

[ ]: Factory setting

(2) Memory Configuration submenu

From the **Advanced** menu, select **Memory Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

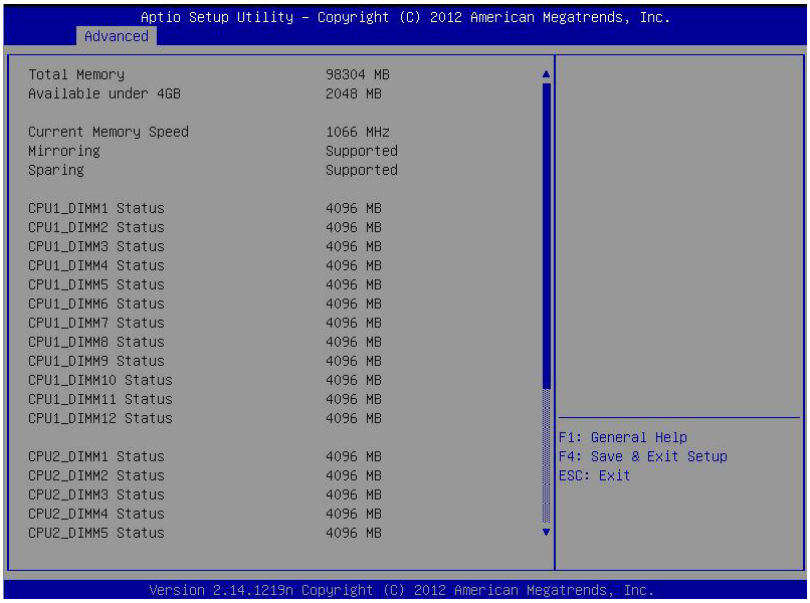


For details about the options, see the table below.

Option	Parameter	Descriptions
Memory Information	–	–
Hardware Memory Test	[Disabled] Enabled	Enable or disable to execute memory test during POST. If a memory error is detected while this option is set to **Enabled**, the relevant memory resource is degraded.
Memory Retest	[No] Yes	When this option is set to **Yes**, error information on memory is cleared, and all DIMMs are reconfigured at the next startup. **No** is automatically selected after DIMMs are reconfigured.
Memory Frequency Limit	[Auto] 800 MHz 1066 MHz 1333 MHz 1600 MHz	Specify the upper limit of operating frequency of memory. The operating frequency may be lowered than the specified value depending on memory configuration.
Memory Voltage	1.5 V [1.35 V]	Specify the operating voltage of memory. The memory voltage may differ from that specified in this parameter depending on memory configuration.
NUMA	Disabled [Enabled]	Enable or disable Non-Uniform Memory Access feature. This option is displayed only in multi-processor configuration..
Memory RAS Mode	[Independent] Mirroring Lock Step Sparing	Specify the memory RAS mode.
Patrol Scrub	[Disabled] Enabled	Enable or disable memory RAS feature (Patrol Scrubbing).
Demand Scrub	Disabled [Enabled]	Enable or disable memory RAS feature (Demand Scrubbing).

[ ]: Factory setting

(a) Memory Information submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Total Memory 98304 MB
Available under 4GB 2048 MB
Current Memory Speed 1066 MHz
Mirroring Supported
Sparing Supported
CPU1_DIMM1 Status 4096 MB
CPU1_DIMM2 Status 4096 MB
CPU1_DIMM3 Status 4096 MB
CPU1_DIMM4 Status 4096 MB
CPU1_DIMM5 Status 4096 MB
CPU1_DIMM6 Status 4096 MB
CPU1_DIMM7 Status 4096 MB
CPU1_DIMM8 Status 4096 MB
CPU1_DIMM9 Status 4096 MB
CPU1_DIMM10 Status 4096 MB
CPU1_DIMM11 Status 4096 MB
CPU1_DIMM12 Status 4096 MB
CPU2_DIMM1 Status 4096 MB
CPU2_DIMM2 Status 4096 MB
CPU2_DIMM3 Status 4096 MB
CPU2_DIMM4 Status 4096 MB
CPU2_DIMM5 Status 4096 MB
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below (display only).

Option	Parameter	Descriptions
Total Memory	–	The physical capacity of installed memory is displayed.
Available under 4 GB	–	Memory capacity available in an area under 4 GB is displayed.
Current Memory Speed	–	The current memory operating frequency is displayed.
Mirroring	Supported Not Possible	**Supported** is displayed when mirroring feature is available in the current memory configuration.
Sparing	Supported Not Possible	**Supported** is displayed when sparing feature is available in the current memory configuration.
CPU1_DIMM1-12 Status **CPU2_DIMM1-12 Status**	Number Number (Error) Disabled Not Present Number (Mirrored) Number (Lock Step) Number (Spared)	Capacity and status of each DIMM is displayed. **Number**: Indicates memory capacity and DIMM is working normally. **Number (Error)**: Indicates memory capacity and failed DIMM is enabled. **Disabled**: Indicates DIMM is degraded due to memory error. **Not Present**: Indicates no DIMM is installed. **Number (Mirrored / Lock Step / Spared)**: Indicates memory capacity and specified mode (Mirrored / Lock Step / Spared) in memory RAS mode.

[ ]: Factory setting

(3) PCI Configuration submenu

From the **Advanced** menu, select **PCI Configuration** and then press the <Enter> key to display the menu screen as shown below.

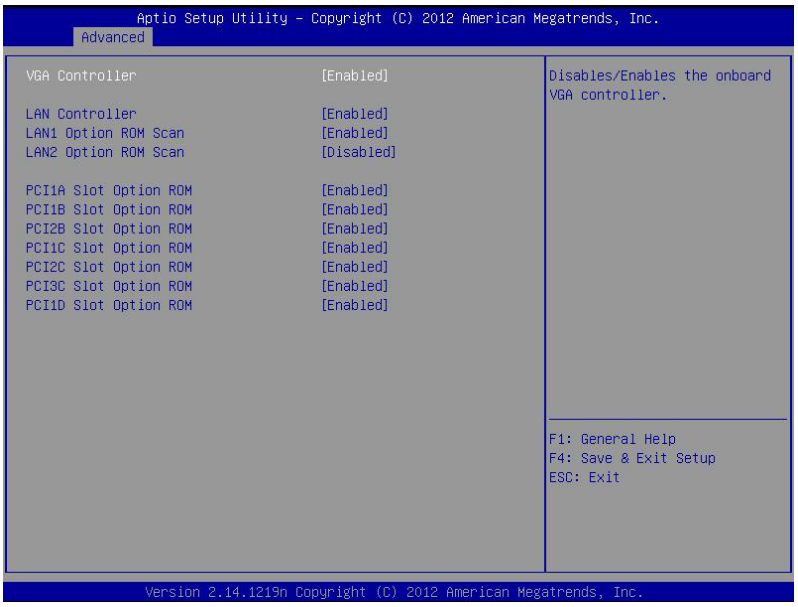
Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
PCI Device Controller and Option ROM Settings
PCI Link Speed Settings
ASPM Support [Disabled]
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
PCI Device Controller and Option ROM Settings	–	–
PCI Link Speed Settings	–	–
ASPM Support	[Disabled] Auto Force L0s	Specify energy-saving level of Active State Power Management. When **Auto** is selected, an appropriate level is automatically specified. When **Force L0s** is selected, the energy-saving level is set to L0s.
4GB PCI Hole Granularity	3 GB [2 GB] 1.5 GB 1 GB	Specify the size of address space for PCI device.
PCI Bus Static Allocation	Disabled [Enabled]	Enable or disable static allocation of PCI bus number.

[ ]: Factory setting

(a) PCI Device Controller and Option ROM Settings submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
VGA Controller [Enabled]
LAN Controller [Enabled]
LAN1 Option ROM Scan [Enabled]
LAN2 Option ROM Scan [Disabled]
PCI1A Slot Option ROM [Enabled]
PCI1B Slot Option ROM [Enabled]
PCI2B Slot Option ROM [Enabled]
PCI1C Slot Option ROM [Enabled]
PCI2C Slot Option ROM [Enabled]
PCI3C Slot Option ROM [Enabled]
PCI1D Slot Option ROM [Enabled]
Disables/Enables the onboard VGA controller.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

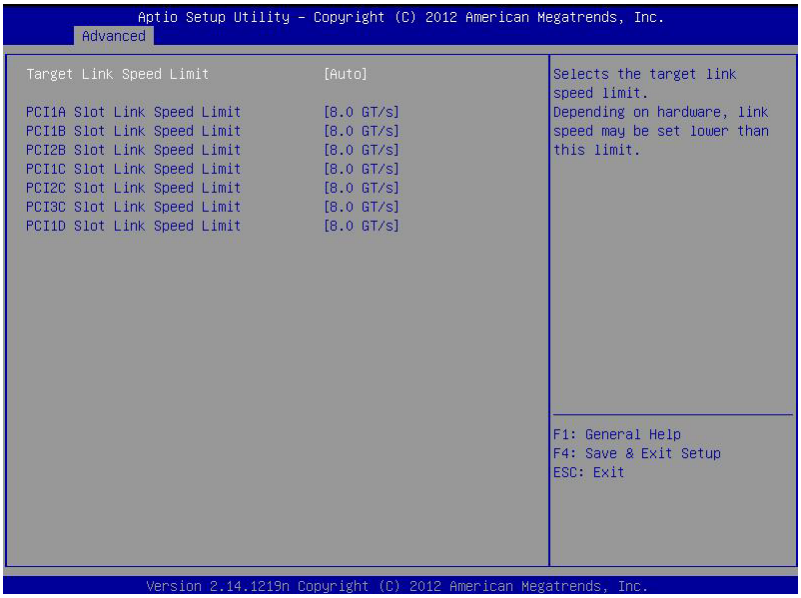
For details about the options, see the table below.

Option	Parameter	Descriptions
VGA Controller	Disabled [Enabled]	Enable or disable the on-board VGA controller.
VGA Priority	[Offboard] Onboard	Specify priority to expand ROM of VGA controller.
LAN Controller	Disabled [Enabled]	Enable or disable the on-board LAN controller.
LAN1 Option ROM Scan	Disabled [Enabled]	Enable or disable the option ROM SCAN for on-board LAN 1.
LAN2 Option ROM Scan	[Disabled] Enabled	Enable or disable the option ROM SCAN for on-board LAN 2.
PCIXX Slot Option ROM	Disabled [Enabled]	Enable or disable the option ROM on each PCI slot. R120d-1M XX:1A/1B/1C/1D R120d-2M XX:1A/1B/2B/1C/2C/3C/1D

[ ]: Factory setting

Note For a RAID Controller, LAN card (network boot), or Fibre Channel controller, if no Hard Disk Drive on which an OS is installed is connected, set the option ROM for that slot to **Disabled**.

(b) PCI Link Speed Settings submenu


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Target Link Speed Limit [Auto]
PCI1A Slot Link Speed Limit [8.0 GT/s]
PCI1B Slot Link Speed Limit [8.0 GT/s]
PCI2B Slot Link Speed Limit [8.0 GT/s]
PCI1C Slot Link Speed Limit [8.0 GT/s]
PCI2C Slot Link Speed Limit [8.0 GT/s]
PCI3C Slot Link Speed Limit [8.0 GT/s]
PCI1D Slot Link Speed Limit [8.0 GT/s]
Selects the target link speed limit.
Depending on hardware, link speed may be set lower than this limit.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
Target Link Speed Limit	[Auto] 2.5 GT/s 5.0 GT/s	Specify the upper limit of link speed of onboard PCI device.
PCIXX Slot Link Speed Limit	2.5 GT/s 5.0 GT/s [8.0 GT/s]	Specify the upper limit of link speed of PCI device in each PCI slot. R120d-1M XX:1A/1B/1C/1D R120d-2M XX:1A/1B/2B/1C/2C/3C/1D

[ ]: Factory setting

(4) Advanced Chipset Configuration submenu

From the **Advanced** menu, select **Advanced Chipset Configuration** and then press the <Enter> key to display the menu screen as shown below.

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Current QPI Link Freq 7.2 GT/s
QPI Frequency Limit [Auto]
HPET [Enabled]
Periodic SMI [Enabled]
VT-d [Enabled]
I/OAT [Enabled]
Wake On LAN/PME [Enabled]
Wake On Ring [Disabled]
Wake On RTC Alarm [Disabled]
Selects the QPI frequency limit.
Depending on processor type, QPI frequency may be set lower than this limit.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
Current QPI Link Freq	Number	The current QPI link speed is displayed (display only). This option is displayed only in multiple processor configuration.
QPI Frequency Limit	[Auto] 6.4 GT/s 7.2 GT/s 8.0 GT/s	Specify the upper limit of QPI link speed.
HPET	Disabled [Enabled]	Enable or disable the High-Precision Event Timer. This feature may not be supported depending on OS.
Periodic SMI	Disabled [Enabled]	Enable or disable periodic SM interrupt.
VT-d	Disabled [Enabled]	Enable or disable Intel(R) Virtualization Technology for Directed I/O feature (Virtualization of I/O feature). This option is displayed only when the installed processor supports this feature.
I/OAT	Disabled [Enabled]	Enable or disable Intel I/O Acceleration Technology feature.
Wake On LAN/PME	Disabled [Enabled]	Enable or disable the feature that remotely powers on through a network.
Wake On Ring	[Disabled] Enabled	Enable or disable the feature that remotely powers on via serial ports (modems).
Wake On RTC Alarm	[Disabled] Enabled	Enable or disable the feature that remotely powers on using the real time clock.

[ ]: Factory setting

Note If the AC power is turned off, the Wake on Ring feature is not available on the next system boot after AC power-on. Press the Power switch to boot the system.

(5) Storage Configuration submenu

From the **Advanced** menu, select **Storage Configuration** and then press the <Enter> key to display the menu screen shown below. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
SATA Information
SATA Mode [IDE Mode]
Hard Disk Pre-Delay [Disabled]
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

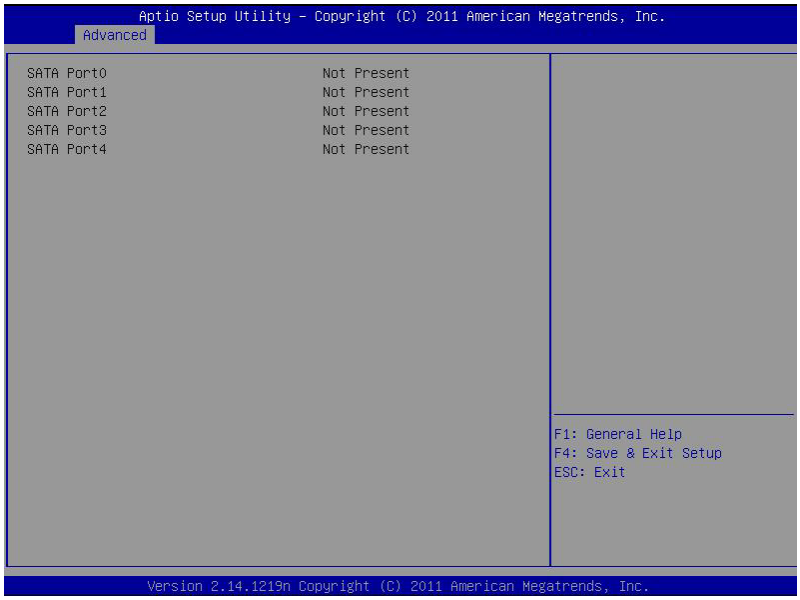
For details about the options, see the table below.

Option	Parameter	Descriptions
SATA Information	–	
SATA Mode	Disabled [IDE Mode] AHCI Mode	Set SATA Mode.
Hard Disk Drive Pre-Delay	[Disabled] 3 Seconds 6 Seconds 9 Seconds 12 Seconds 15 Seconds 21 Seconds 30 Seconds	Specify delay time before HDD is accessed during POST.

[ ]: Factory setting

Note NEC has not verified AHCI driver support.

(a) SATA Information submenu


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
SATA Port0 Not Present
SATA Port1 Not Present
SATA Port2 Not Present
SATA Port3 Not Present
SATA Port4 Not Present
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2011 American Megatrends, Inc.

For details about the options, see the table below (display only).

Option	Parameter	Descriptions
SATA Port0	–	A device connected to each port is displayed.
SATA Port1		
SATA Port2		
SATA Port3		
SATA Port4		

[ ]: Factory setting

(6) USB Configuration submenu

From the **Advanced** menu, select **USB Configuration** and then press the <Enter> key to display the menu screen shown below.

Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Device Reset Timeout [20 sec]
Controller Timeout [20 sec]
Selects USB mass storage device Start Unit command timeout.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

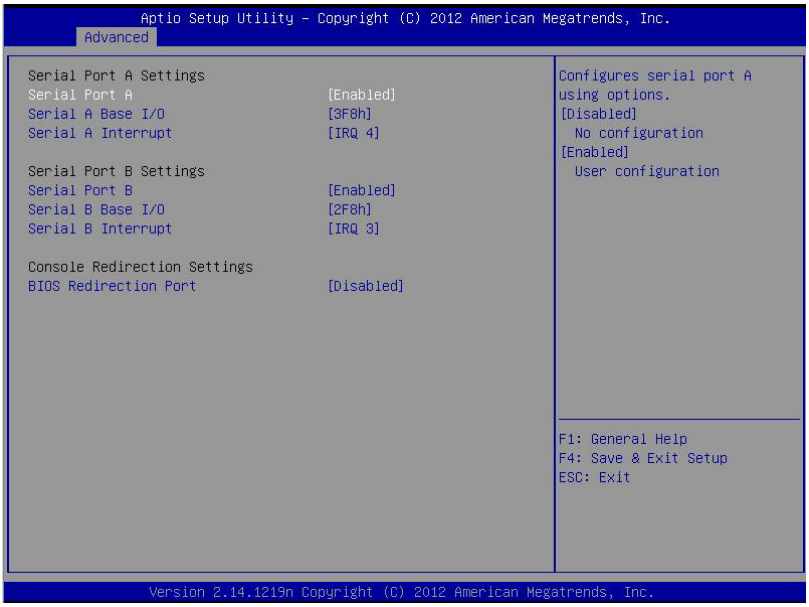
For details about the options, see the table below.

Option	Parameter	Descriptions
Device Reset Timeout	10 sec [20 sec] 30 sec 40 sec	Specify the timeout period when Start Unit command is issued to USB Mass Storage Device.
Controller Timeout	1 sec 5 sec 10 sec [20 sec]	Specify the timeout period when Control, Bulk, and Interrupt Transfer commands are issued to USB Controller.

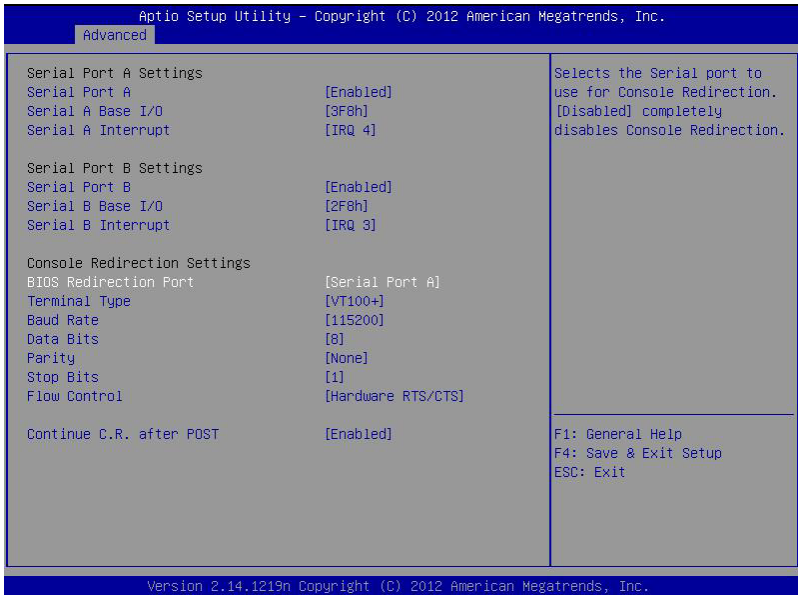
[ ]: Factory setting

(7) Serial Port Configuration submenu

From the **Advanced** menu, select **Serial Port Configuration** and then press the <Enter> key to display the menu screen shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Serial Port A Settings
Serial Port A [Enabled]
Serial A Base I/O [3F8h]
Serial A Interrupt [IRQ 4]
Serial Port B Settings
Serial Port B [Enabled]
Serial B Base I/O [2F8h]
Serial B Interrupt [IRQ 3]
Console Redirection Settings
BIOS Redirection Port [Disabled]
Configures serial port A using options.
[Disabled]
No configuration
[Enabled]
User configuration
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

From **BIOS Redirection Port**, select **Serial Port A** or **Serial Port B** and then press the <Enter> key to display the menu screen shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Advanced
Serial Port A Settings
Serial Port A [Enabled]
Serial A Base I/O [3F8h]
Serial A Interrupt [IRQ 4]
Serial Port B Settings
Serial Port B [Enabled]
Serial B Base I/O [2F8h]
Serial B Interrupt [IRQ 3]
Console Redirection Settings
BIOS Redirection Port [Serial Port A]
Terminal Type [VT100+]
Baud Rate [115200]
Data Bits [8]
Parity [None]
Stop Bits [1]
Flow Control [Hardware RTS/CTS]
Continue C.R. after POST [Enabled]
Selects the Serial port to use for Console Redirection. [Disabled] completely disables Console Redirection.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

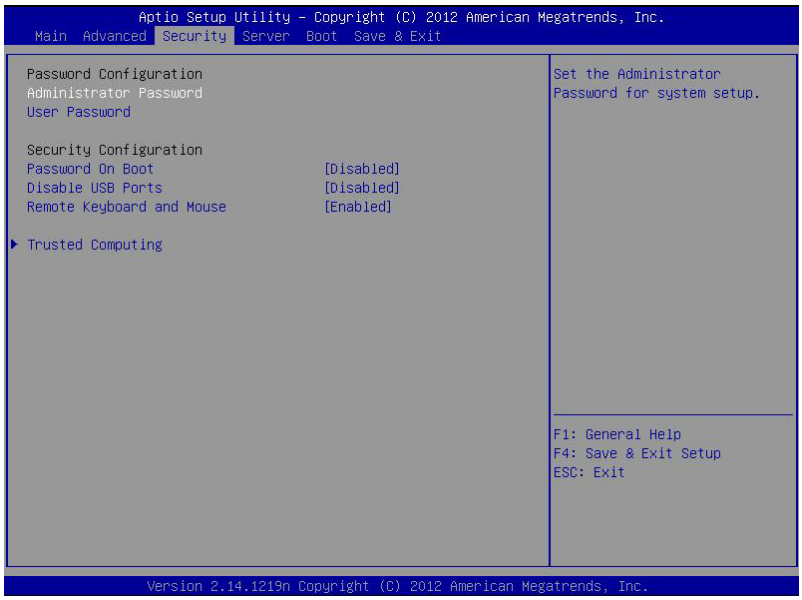
For details about the options, see the table below.

Option	Parameter	Descriptions
Serial Port A Settings	–	–
Serial Port A	Disabled [Enabled]	Enable or disable serial Port A
Serial A Base I/O	[3F8h] 2F8h 3E8h 2E8h	Specify the base I/O address for serial port A.
Serial A Interrupt	[IRQ 4] IRQ 3	Specify the interrupt for serial port A
Serial Port B Settings	–	–
Serial Port B	Disabled [Enabled]	Enable or disable serial Port B
Serial B Base I/O	3F8h [2F8h] 3E8h 2E8h	Specify the base I/O address for serial port B
Serial B Interrupt	IRQ 4 [IRQ 3]	Specify the interrupt for serial port B
Console Redirection Settings	–	–
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Enable or disable the console redirection feature for the specified serial port. Specifying [Serial Port A] or [Serial Port B] allows direct connection via terminal unit such as NEC ESMPRO Manager, and options for connection shown below are displayed.
Terminal Type	[VT100+] VT-UTF8 PC-ANSI	Select the terminal type.
Baud Rate	9600 19200 57600 [115200]	Specify baud rate.
Data Bits	7 [8]	Specify data bit width.
Parity	[None] Even Odd	Specify parity type.
Stop Bits	[1] 2	Specify stop bits.
Flow Control	None [Hardware RTS/CTS]	Specify the flow control method.
Continue C.R. after POST	Disabled [Enabled]	Select whether the console redirection is continued after completion of POST or not.

[ ]: Factory setting

1.2.3 Security

If you move the cursor to **Security**, the **Security** menu appears. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus. Then configure the settings.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
Password Configuration
Administrator Password
User Password
Security Configuration
Password On Boot [Disabled]
Disable USB Ports [Disabled]
Remote Keyboard and Mouse [Enabled]
Trusted Computing
Set the Administrator Password for system setup.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

Select **Administrator Password** or **User Password**, and then press the <Enter> key to display the screen where you can register/change the password.

Tips

- User Password cannot be set without setting Administrator Password
- Do not set any password before installing OS.
- If you have forgotten any password, contact the store where you purchased the product or your maintenance service company.

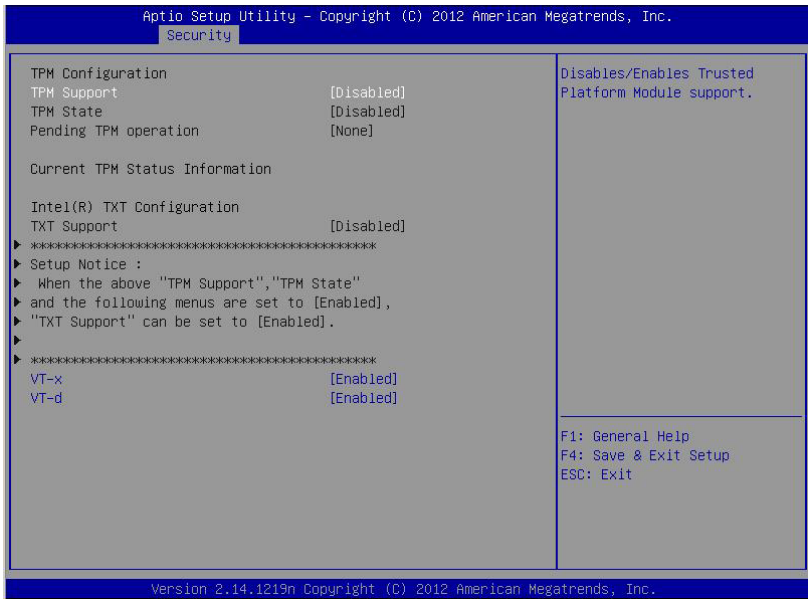
For details about the options, see the table below.

Option	Parameter	Descriptions
Password Configuration	–	–
Administrator Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the password entry screen to set administrative right is displayed. This password can be used to access all **SETUP** menus. Password can be set only when SETUP is started by administrative right. If no password is set, SETUP starts with administrative right.
User Password	Up to 20 alphanumeric characters	When the <Enter> key is pressed, the password entry screen to set user right is displayed. With this password, access to SESTUP menus is limited. The user password can be set when SETUP is started by administrative right or user right.
Security Configuration	–	–
Password On Boot	[Disabled] Enabled	Enable or disable the feature that requires a password entry on boot. This option can be selected when **Administrator Password** is set.
Disable USB Ports	[Disabled] Front Rear Internal Front + Rear Front + Internal Rear + Internal Front + Rear + Internal	Select a port to be disabled. Note that USB keyboard is enabled only while the POST is running. If the internal USB port is disabled, EXPRESSBUILDER built-in kit cannot be used.
Remote Keyboard and Mouse	Disabled [Enabled]	Enable or disable the remote keyboard and mouse supported by BMC.
Trusted Computing		This submenu is available for configuration only when **Administrator Password** has been set.

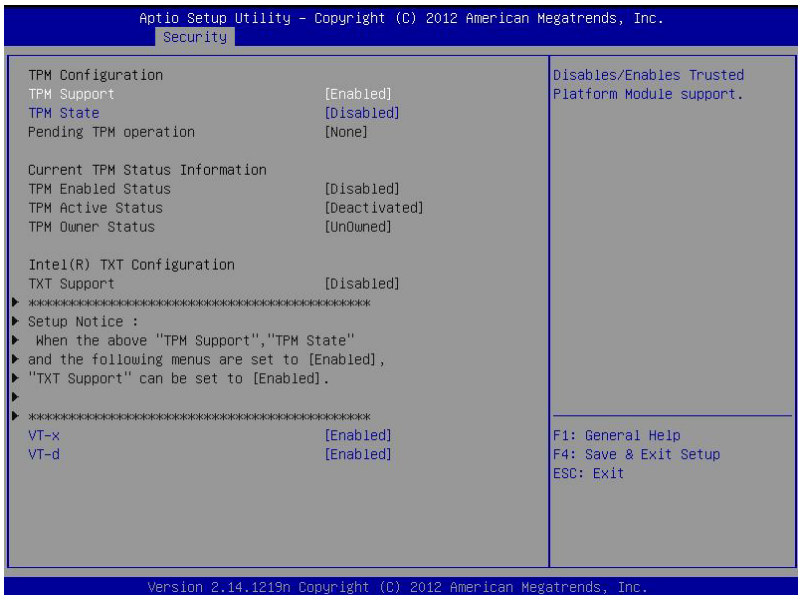
[ ]: Factory setting

(1) Trusted Computing submenu

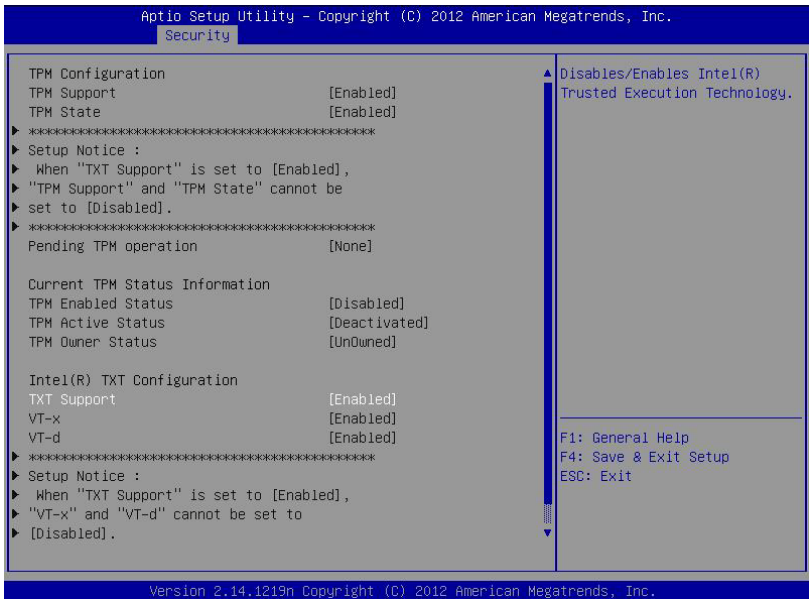
From the **Security** menu, select **Trusted Computing** and then press the <Enter> key to display the menu screen shown below.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Security
TPM Configuration
TPM Support [Disabled]
TPM State [Disabled]
Pending TPM operation [None]
Current TPM Status Information
Intel(R) TXT Configuration
TXT Support [Disabled]
Setup Notice :
When the above "TPM Support","TPM State"
and the following menus are set to [Enabled],
"TXT Support" can be set to [Enabled].
VT-x [Enabled]
VT-d [Enabled]
Disables/Enables Trusted
Platform Module support.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

If you enable TPM Support, the following menu screen appears.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Security
TPM Configuration
TPM Support [Enabled]
TPM State [Disabled]
Pending TPM operation [None]
Current TPM Status Information
TPM Enabled Status [Disabled]
TPM Active Status [Deactivated]
TPM Owner Status [UnOwned]
Intel(R) TXT Configuration
TXT Support [Disabled]
Setup Notice :
When the above "TPM Support","TPM State"
and the following menus are set to [Enabled],
"TXT Support" can be set to [Enabled].
VT-x [Enabled]
VT-d [Enabled]
Disables/Enables Trusted
Platform Module support.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

If TXT Support is enabled, the following screen is displayed.



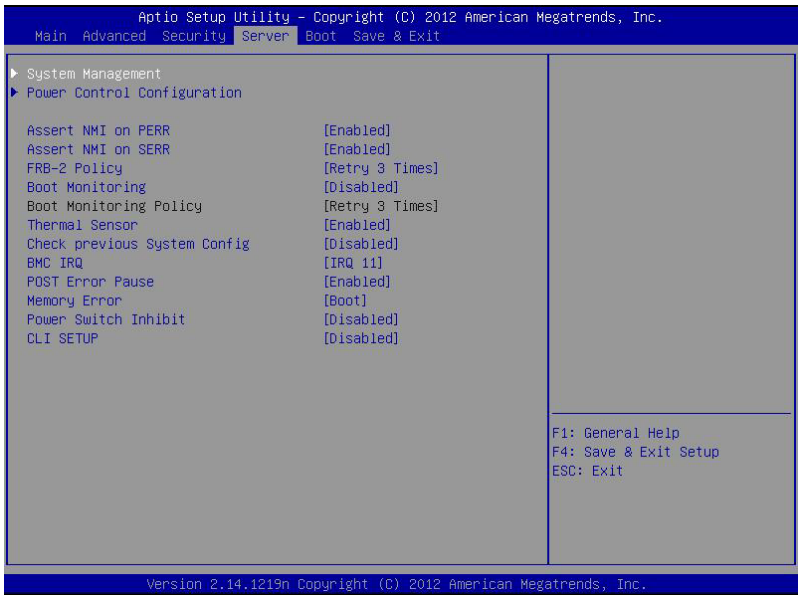
For details about the options, see the table below.

Option	Parameter	Descriptions
TPM Configuration	–	–
TPM Support	[Disabled] Enabled	Enable or disable Trusted Platform Module feature. When set to **Enabled**, **Current TPM Status Information** is displayed.
TPM State	[Disabled] Enabled	Enable or disable TPM features. This option can be selected when TPM Support is set to **Enabled**.
Pending TPM operation	[None] Enable Take Ownership Disable Take Ownership TPM Clear	Configure TPM operation. This option can be selected when TPM State is set to **Enabled**.
Current TPM Status Information	–	–
TPM Enabled Status	Enabled Disabled	Current status of TPM feature is displayed. (Display only)
TPM Active Status	Activated Deactivated	
TPM Owner Status	Owmed UnOwned	
Intel(R) TXT Configuration	–	–
TXT Support	[Disabled] Enabled	Enable or disable Trusted Execution Technology feature. This option can be selected when VT-x, VT-d, and TPM State are set to **Enabled**.
VT-x	Disabled [Enabled]	Enable or disable Intel(R) Virtualization Technology (feature to virtualize processor).
VT-d	Disabled [Enabled]	Enable or disable Intel(R) Virtualization Technology for Directed I/O feature (Virtualization of I/O feature). This option is displayed only when the installed processor supports this feature.

[ ]: Factory setting

1.2.4 Server

If you move the cursor to **Server**, the **Server** menu screen appears. For the menu that has ▶ on the left, move the cursor to it and then press the <Enter> key to show its submenus.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
System Management
Power Control Configuration
Assert NMI on PERR [Enabled]
Assert NMI on SERR [Enabled]
FRB-2 Policy [Retry 3 Times]
Boot Monitoring [Disabled]
Boot Monitoring Policy [Retry 3 Times]
Thermal Sensor [Enabled]
Check previous System Config [Disabled]
BMC IRQ [IRQ 11]
POST Error Pause [Enabled]
Memory Error [Boot]
Power Switch Inhibit [Disabled]
CLI SETUP [Disabled]
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

The **Server** menu screen shows the options you can configure and their features. For the menu **System Management**, move the cursor to it and then press the <Enter> key to show its submenus.

(1/2)

Option	Parameter	Descriptions
System Management	–	–
Power Control Configuration	–	–
Assert NMI on PERR	Disabled [Enabled]	Enable or disable feature to detect PCI PERR.
Assert NMI on SERR	Disabled [Enabled]	Enable or disable feature to detect PCI SERR.
FRB-2 Policy	[Retry 3 Times] Disable FRB2 Timer Always Reset	Specify how the system should operate if FRB level 2 errors occur.
Boot Monitoring	[Disabled] 5-60 minutes	Enable or disable the boot monitoring feature and specify the timeout period. To use this feature, NEC ESMPRO Agent must be installed on OS. If starting up an OS on which it is not installed, disable this feature
Boot Monitoring Policy	[Retry 3 times] Always Reset	Specify the processing to be done when time-out was enforced during boot monitoring and the server was automatically reset. **Retry 3 times:** Attempts to boot OS up to three times. **Always Reset:** Retries booting the OS repeatedly. This option can be selected only when **Boot Monitoring** has been enabled.

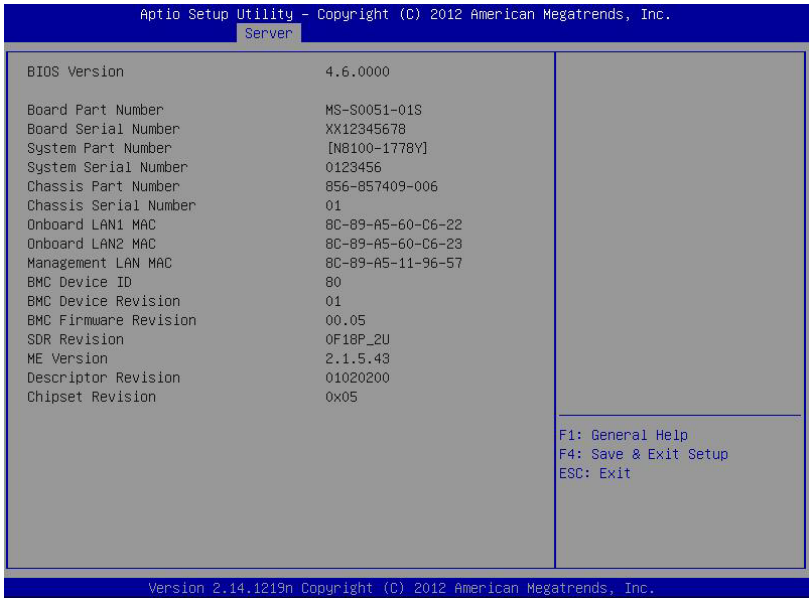
(2/2)

Option	Parameter	Descriptions
Thermal Sensor	Disabled [Enabled]	Enable or disable the thermal sensor monitoring feature. If this option is set to **Enabled** and when abnormal temperature is detected, stops POST before OS starts and waits until the temperature becomes normal.
Check previous System Config	[Disabled] Enabled	Enable or disable the feature to detect system configuration change. If this option is set to **Enabled** and the system configuration differs from the previous boot, the system stops before OS booting and displays confirmation message whether to continue booting. At this time, POST pauses until user's response is made.
BMC IRQ	Disabled [IRQ 11]	Specify whether to allocate interrupt lines for BMC (Baseboard Management Controller).
Post Error Pause	Disabled [Enabled]	Enable or disable the feature to suppress OS booting when POST detects an error, until user's response is made. When set to **Disabled**, continues OS booting regardless of user's response even if an error is detected during POST.
Memory Error	Halt [Boot]	Enable or disable the feature to suppress OS booting when POST detects a memory degradation error, until user's response is made. This option is valid only when **POST Error Pause** is set to **Enabled**. Even if this option is set to **Boot**, POST stops to suppress OS booting if all of thememory resources are degraded.
Power Switch Inhibit	[Disabled] Enabled	Enable or disable the POWER switch inhibit feature.
CLI SETUP	[Disabled] Enabled	Enable or disable the Command Line Interface SETUP feature. When this option is set to **Enabled**, the operation of SETUP is changed to use Command Line Interface. To switch back to the menu operation, set this option to **Disabled**.

[ ]: Factory setting

(1) System Management submenu

From the **Server** menu, move the cursor to **System Management** and then press the <Enter> key to show its submenus.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Server
BIOS Version 4.6.0000
Board Part Number MS-S0051-01S
Board Serial Number XX12345678
System Part Number [N8100-1778Y]
System Serial Number 0123456
Chassis Part Number 856-857409-006
Chassis Serial Number 01
Onboard LAN1 MAC 8C-89-A5-60-C6-22
Onboard LAN2 MAC 8C-89-A5-60-C6-23
Management LAN MAC 8C-89-A5-11-96-57
BMC Device ID 80
BMC Device Revision 01
BMC Firmware Revision 00.05
SDR Revision 0F18P_2U
ME Version 2.1.5.43
Descriptor Revision 01020200
Chipset Revision 0x05
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

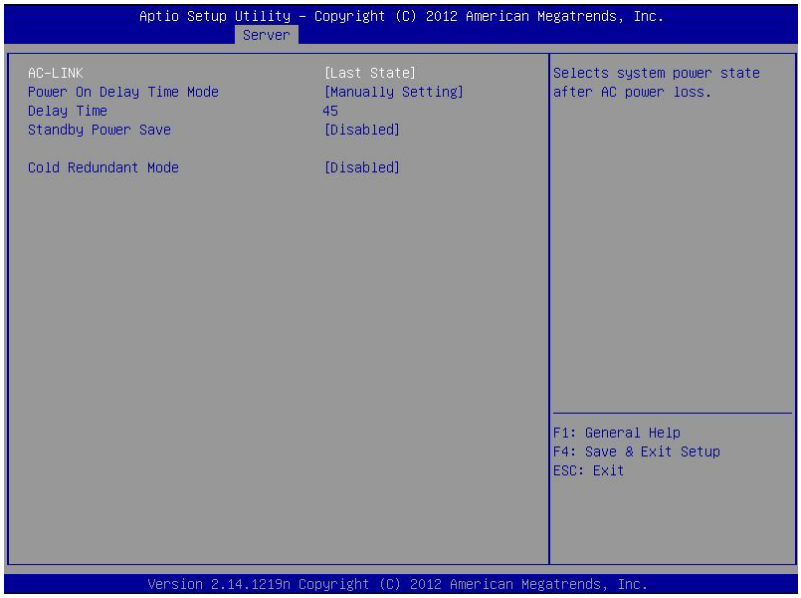
For details about the options, see the table below (display only).

Option	Parameter	Descriptions
BIOS Version	–	The current BIOS version is displayed.
Board Part Number	–	The part number of motherboard is displayed.
Board Serial Number	–	The serial number of motherboard is displayed.
System Part Number	–	The part number of the system is displayed.
System Serial Number	–	The serial number of the system is displayed.
Chassis Part Number	–	The part number of chassis is displayed.
Chassis Serial Number	–	The serial number of chassis is displayed.
Onboard LAN1 MAC	–	The MAC addoress of onboard LAN1 is displayed.
Onboard LAN2 MAC	–	The MAC addoress of onboard LAN2 is displayed.
Management LAN MAC	–	The MAC address of management LAN port is displayed.
BMC Device ID	–	The device ID of BMC is displayed.
BMC Device Revision	–	The revision of BMC is displayed.
BMC Firmware Revision	–	The firmware revision of BMC is displayed.
SDR Revision	–	The revision of Sensor Data Record is displayed.
ME Version	–	The firmware version of Management Engine is displayed.
Descriptor Revision	–	The revision of descriptor is displayed.
Chipset Revision	–	The revision of chipset is displayed.

[ ]: Factory setting

(2) Power Control Configuration submenu

From the **Server** menu, move the cursor to **Power Control Configuration** and then press the <Enter> key to show its submenus.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Server
AC-LINK [Last State]
Power On Delay Time Mode [Manually Setting]
Delay Time 45
Standby Power Save [Disabled]
Cold Redundant Mode [Disabled]
Selects system power state after AC power loss.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
AC-LINK	Stay Off [Last State] Power On	Specify AC link feature. Specify how the DC power state should be when the AC power is supplied again after loss of power. (See the table below)
Power ON Delay Time Mode	[Manually Setting] Random	Select a method to specify the delay time before powering on DC power. Available options are: "User-specified value" or "random value". This option is selectable when **Power On** or **Last State** is specified in **AC-LINK**.
Delay Time	[45]-600	Specify the delay time within the range between **"xx"** and 600 seconds. The minimum configurable time is displayed when executing **Load Setup Defaults**. This menu appears when **Manually Setting** is specified for **Power ON Delay Time Mode**.
Standby Power Save	[Disabled] Enabled	Enable or disable the feature that saves the standby power on standby. If this option is set to **Enabled**, the **AC-LINK** setting is fixed to **Power On** automatically and cannot be changed. With AC power off state, management, monitoring, and power-on of server are disabled on remote site. Powering on the server is available only by pressing the POWER switch on the server. If AC-LINK setting is changed from the remote site with this option being set, you need to press the POWER switch twice to power on the server.
Cold Redundant Mode	[Disabled] Enabled	Enable or disable Cold Redundancy feature.

[ ]: Factory setting

The table below shows the operation of DC power when the AC power is turned off once and then back on, in accordance with the **AC LINK** setting.

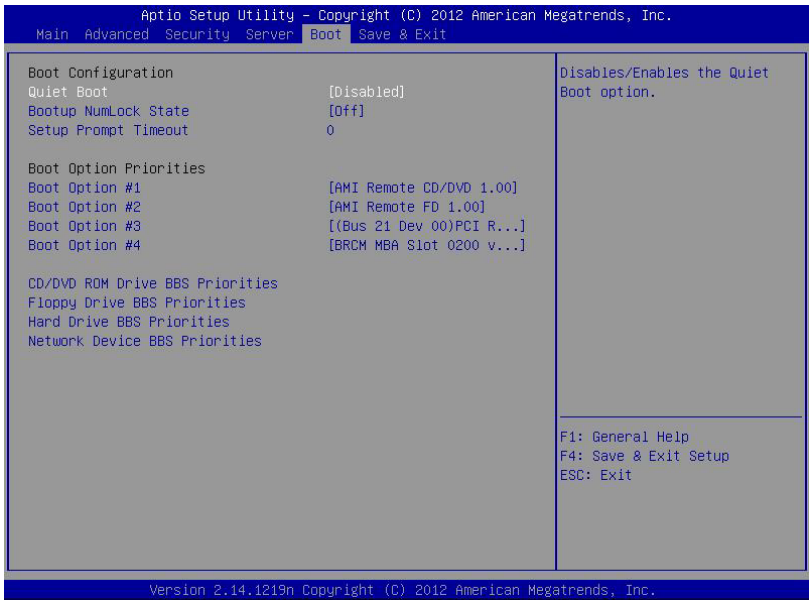
System status before AC power was turned off	AC LINK setting		
	Stay Off	Last State	Power On
Operating (DC power is ON)	Off	On	On
Abort (DC power is also OFF)	Off	Off	On
Forced shutdown*	Off	On	On

* Continue pressing the POWER switch for at least 4 seconds to forcibly turn off the power.

Tips If an uninterruptible power supply (UPS) is used for automatic operation, set the **AC-LINK** to **Power On**.

1.2.5 Boot

If you move the cursor to **Boot**, the **Boot** menu where you can configure the boot order appears.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
Boot Configuration
Quiet Boot [Disabled]
Bootup NumLock State [Off]
Setup Prompt Timeout 0
Boot Option Priorities
Boot Option #1 [AMI Remote CD/DVD 1.00]
Boot Option #2 [AMI Remote FD 1.00]
Boot Option #3 [(Bus 21 Dev 00)PCI R...]
Boot Option #4 [BRCM MBA Slot 0200 v...]
CD/DVD ROM Drive BBS Priorities
Floppy Drive BBS Priorities
Hard Drive BBS Priorities
Network Device BBS Priorities
Disables/Enables the Quiet Boot option.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

For details about the options, see the table below.

Option	Parameter	Descriptions
Boot Configuration	–	–
Quiet Boot	Disabled [Enabled]	Enable or disable the feature to display logo during POST. When this option is set to **Disabled**, the results of POST execution are displayed instead of the NEC logo. If **BIOS Redirection Port** is enabled, this option is shown as **Unavailable** and inaccessible (run with **Disabled** state automatically)
Bootup Numlock State	On [Off]	Enable or disable Numlock feature of keyboard.
Setup Prompt Timeout	Number	Specify the time until the <F2> is pressed to launch SETUP.
Boot Option Priorities	–	–
Boot Option #1	–	These items display the priority of boot devices. If all of the Boot Options are set to **Disabled**, the SETUP starts running upon completion of POST.
Boot Option #2	–	
Boot Option #3	–	
Boot Option #4	–	
CD/DVD ROM Drive BBS Priorities	–	Specify the boot priority for each BBS (BIOS Boot Specification).
Floppy Drive BBS Priorities	–	
Hard Drive BBS Priorities	–	
Network Drive BBS Priorities	–	

[ ]: Factory setting

1. When BIOS detects a bootable device, information on the device is displayed in the designated area.
2. The boot priority (from first to forth) of the registered boot devices can be changed using the <↑>/<↓> and <+>/<–> keys.
   Move the cursor to a device using the <↑>/<↓> keys, and change the priority using the <+>/<–> keys.

Note

When SATA Hard Disk Drive is used in IDE mode, the default boot priority in Hard Drive BBS Priorities is set as follows.

Hard Disk Drive Slot 0

Hard Disk Drive Slot 2

Hard Disk Drive Slot 1

Hard Disk Drive Slot 3

If the HDDs in Hard Disk Drive Slot 0 and Hard Disk Drive Slot 1 are switched, for example, the boot priority of HDD may change. If this happens, execute **Load Setup Defaults** in the **Save & Exit** menu, clear the settings of the boot priority to the default settings, and then configure the priority again.

When SATA HDD is used in IDE mode, the boot priority of HDDs with the same serial number cannot be changed. .

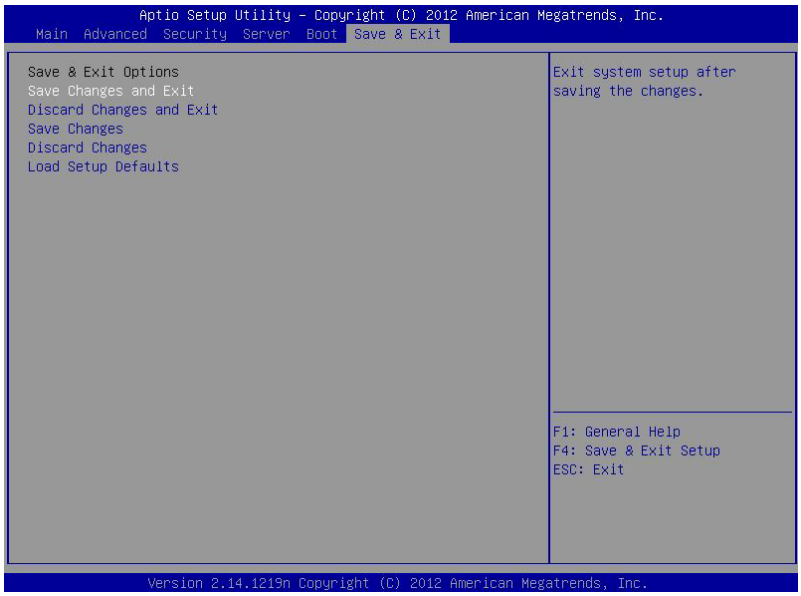
Tips

- If a bootable device is newly connected, the priority lowest in its BBS Priorities is assigned to that device.
- If a bootable device is disconnected from the server, the relevant device is removed from BBS Priorities.
- When **Load Setup Defaults** is executed on **Save & Exit** menu, the **Boot Option** and **BBS Priorities** are changed as follows.
  - Boot Option Priorities
    - Boot Option #1: CD/DVD ROM Drive
    - Boot Option #2: Floppy Drive
    - Boot Option #3: Hard Drive
    - Boot Option #4: Network Device
  - The priority of bootable devices in BBS Priorities are determined as follows:
    Devices other than USB device (e.g., SATA device, RAID): High
    USB device: Next to non-USB devices
  - If a bootable device has been set to **Disabled**, cancel the Disabled status, and register the device in **BBS Priorities**.
- If a Remote Management Extended License (*1) is registered, the remote media is added to bootable devices. The remote media is assigned as follows:
  - The highest priority within "CD/DVD ROM Drive BBS Priorities" is assigned to AMI Remote CD/DVD device.
  - When executing Load Setup Defaults in Save & Exit menu, the highest priority within "CD/DVD ROM Drive BBS Priorities" is assigned to AMI Remote CD/DVD device.

(*1) Refer to *EXPRESSSCOPE Engine 3 User's Guide* for details of Remote Management Extended License.

1.2.6 Save & Exit

If you move the cursor to **Save & Exit**, the **Save & Exit** menu appears.


Aptio Setup Utility – Copyright (C) 2012 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
Save & Exit Options
Save Changes and Exit
Discard Changes and Exit
Save Changes
Discard Changes
Load Setup Defaults
Exit system setup after saving the changes.
F1: General Help
F4: Save & Exit Setup
ESC: Exit
Version 2.14.1219n Copyright (C) 2012 American Megatrends, Inc.

The options of this menu are described below.

(a) Save Changes and Exit

The SETUP utility closes with all the changes saved in NVRAM (Non-volatile memory). After the SETUP utility closes, the system automatically reboots.

(b) Discard Changes and Exit

The SETUP utility closes without saving the changes in NVRAM. The setting at startup of SETUP utility is retained.
After the SETUP utility closes, the system automatically reboots.

(c) Save Changes

Changes are saved in NVRAM.

(d) Discard Changes

The changes are discarded and the settings are reset to the one at startup of SETUP utility.

(e) Load Setup Defaults

This option resets all values in the SETUP utility to the default settings.

Note Reconfigure each item according to your environment by referring to the list of settings in this section.

2. Flash FDD

Flash FDD is a device that is compatible with a floppy disk drive.

One Flash FDD can be connected to a USB connector of this server. If another USB or floppy disk drive is connected to this server, be sure to disconnect it.

CAUTION

Be extremely careful not to lose Flash FDD or have it stolen.
If Flash FDD is lost, stolen, misappropriated, or fraudulently obtained, there is a risk of leaking confidential information to a third party. NEC assumes no responsibility for damages caused by leaking confidential information in this way.

The write protection of Flash FDD is the status before connecting to this server. If you want to change the write protection, remove Flash FDD from the server, change the write protection switch, and then connect it again.

Note Be careful not to accidentally flip the write protection switch while connecting Flash FDD to or removing it from the server.

2.1 Notes on Using Flash FDD

Flash FDD is only intended as a temporary means of recording a driver, so do not use it to back up data.

2.1.1 Compensation for recorded data

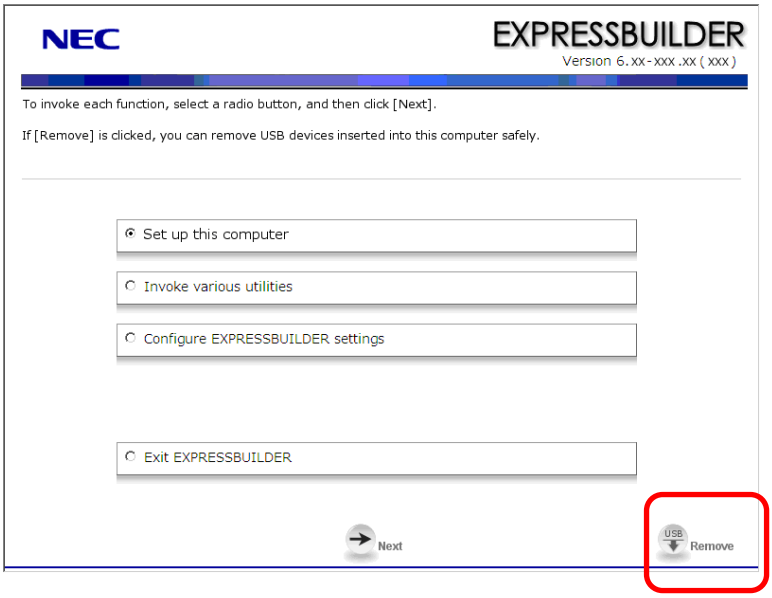
NEC will not pay compensation for data recorded on Flash FDD if the data is lost.

2.1.2 Handling Flash FDD

- Flash FDD is consumables.
  If Flash FDD causes an error, use a new Flash FDD.
- Do not turn off the server while the access LED of Flash FDD is blinking.
  Turning off the server at this time can cause a failure or data corruption.
- Flash FDD cannot be connected via USB hub. Directly connect Flash FDD to USB connector of the server.
- Before touching Flash FDD, discharge static electricity from your body by touching a nearby metal object (such as a doorknob or aluminum frame).
- Do not disassemble Flash FDD.
- Do not apply a strong force to Flash FDD
- Do not place Flash FDD in an area directly exposed to sunlight or near a heater.
- Do not handle Flash FDD while eating, drinking, or smoking. Also, avoid contact with thinner, alcohol, or other corrosive substances.
- Carefully connect Flash FDD to the server.
- Do not move the server while Flash FDD is connected to USB connector.
- Remove Flash FDD from the server after use.

2.1.3 Use in EXPRESSBUILDER

- Connect Flash FDD after Top Menu appears.
- When you exit EXPRESSBUILDER, remove Flash FDD from the server first.
- Click [Remove] in the lower right corner of the menu to disable Flash FDD, and then remove it.


NEC
EXPRESSBUILDER
Version 6.xx-xxx.xx (xxx)
To invoke each function, select a radio button, and then click [Next].
If [Remove] is clicked, you can remove USB devices inserted into this computer safely.
Set up this computer
Invoke various utilities
Configure EXPRESSBUILDER settings
Exit EXPRESSBUILDER
Next
Remove

3. Power Control Feature

For a device that has a Xeon Processor, power consumption of the server can be controlled through the command line interface of EXPRESSSCOPE Engine 3 (BMC) or by using NEC ESMPRO Manager. This feature curves the upper limit of the power consumption, which allows more servers to be installed in the environment where the power consumption is limited.

For settings information, refer to "*EXPRESSSCOPE Engine3 User's Guide*" or *NEC ESMPRO Manager online help*.

3.1 Supported OS

The power control feature is available for the following OSs.

OSs that support the power control feature

- Windows Server 2003 R2, Standard Edition (SP2 or later)
- Windows Server 2003 R2, Enterprise Edition (SP2 or later)
- Windows Server 2003 R2, Standard x64 Edition (SP2 or later)
- Windows Server 2003 R2, Enterprise x64 Edition (SP2 or later)
- Windows Server 2008, Standard
- Windows Server 2008, Enterprise
- Windows Server 2008, Standard x64
- Windows Server 2008, Enterprise x64
- Windows Server 2008 R2, Standard x64
- Windows Server 2008 R2, Enterprise x64

3.2 Notes on Using Windows Server 2008

The event shown below will be logged in Event Viewer if power control feature is used on Windows Server 2008. However, it is the normal operation and the event is logged because the P-State is controlled by the server side.

```
Source:    Kernel-Processor-Power
Event ID:  7
Level:     Warning
User:      SYSTEM
```

4. RAID System Configuration

4.1 WebBIOS and Universal RAID Utility

The points to be noted when using Universal RAID Utility together with WebBIOS are described below.

(1) Terms

Some terms are different between WebBIOS and Universal RAID Utility. When using Universal RAID Utility together with WebBIOS, replace the terms as shown in the table below:

Terms of WebBIOS	Terms of Universal RAID Utility	
	RAID Viewer	raidcmd
Adapter	RAID Controller	RAID Controller
Virtual Drive	Logical Drive	Logical Drive
Drive group	Disk Array	Disk Array
Drive	Physical Device	Physical Device

Tips `raidcmd` is a command provided by Universal RAID Utility. For details, refer to "*Universal RAID Utility User's Guide*".

(2) Numbering

Numbers indicating RAID Controller configuration differ between WebBIOS and Universal RAID Utility as shown in the table below.

Refer to "*Universal RAID Utility User's Guide*" for details.

Item	Numbering	
	WebBIOS	Universal RAID Utility
Adapter (RAID Controller)	Starts from 0	Starts from 1
Virtual Drive (Logical Drive)	Starts from 0	Starts from 1
Drive group (Disk Array)	Starts from 0	Starts from 1
Drive (Physical Device)	Starts from 0	To be assigned based on an enclosure that contains the physical device and its slot number.

(3) Priority settings

For setting and displaying the priority of the background tasks (Rebuild, Patrol Read, and Consistency Check) for the RAID Controller, WebBIOS uses numerical values while Universal RAID Utility uses three levels of High, Middle, and Low. The table below shows the correspondence between the numerical value ranges and levels for each item. In this case, the priority is the percentage of the background task processing to all processes being processed by the RAID Controller.

[Setting values (WebBIOS) and display levels (Universal RAID Utility)]

Item	Setting values of WebBIOS	Display levels of Universal RAID Utility
Rebuild priority	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Patrol Read priority	80 to 100	High
	31 to 79	Middle
	0 to 30	Low
Consistency Check priority	80 to 100	High
	31 to 79	Middle
	0 to 30	Low

[Values to be set when changing the level with Universal RAID Utility]

Item	Selection levels of Universal RAID Utility	Setting values
Rebuild priority	High	90
	Middle	50
	Low	10
Patrol Read priority	High	90
	Middle	50
	Low	10
Consistency Check priority	High	90
	Middle	50
	Low	10

Tips

- WebBIOS can specify the background initialization priority, but Universal RAID Utility cannot.
- Although Universal RAID Utility can specify the priority of initialization (Slow Initialize), this server does not support this function.

5. Details of EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows and check the server. Bundled software and documents are provided in EXPRESSBUILDER.

5.1 Storage Media

EXPRESSBUILDER can be operated from the following two ways.

Tips Remove other removable media before starting EXPRESSBUILDER.

DVD:

EXPRESSBUILDER DVD is supplied as standard. This is used in the following two ways:

(1) Insert the DVD to the optical disk drive of the server, and then reboot by turning off and on the server or by pressing <Ctrl> + <Alt> + <Delete> keys.

Boot Selection Menu shown in *Chapter 2 (5.2 Menu) - (1) Boot Selection Menu* appears.

(2) Insert the DVD into a computer on which Windows is running.

Autorun Menu shown in *Chapter 2 (5.2 Menu) - (4) Autorun Menu* appears.

Internal Flash Memory (optional):

If Internal Flash Memory is installed in the server, EXPRESSBUILDER can be started from it.

Note It is necessary to copy EXPRESSBUILDER to Internal Flash Memory first except BTO(Built to order). For details, refer to *(2) Manage* in *Chapter 2 (5.4 Setting Up EXPRESSBUILDER Operating Environment)*.

Press <F3> key when the following message appears on POST screen. At this time, **be sure to remove a bootable disc from the optical disk drive**.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If <F3> Internal Flash Memory is not displayed on POST screen, make sure that Internal Flash Memory is connected correctly by referring to a) in *Chapter 2 (5.4 Configure EXPRESSBUILDER Settings) - (2) Manage Internal Flash Memory* .

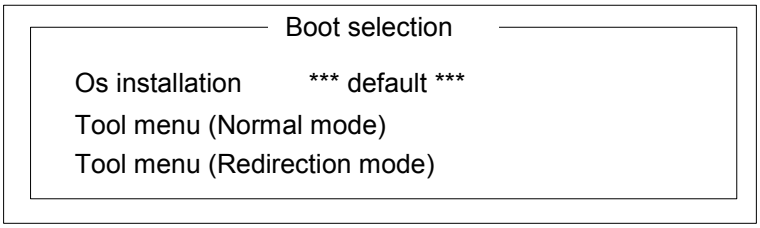
When EXPRESSBUILDER is started from Internal Flash Memory, Boot Selection Menu shown in *Chapter 2 (5.2 Menu) - (1) Boot Selection Menu* appears.

5.2 Menu

EXPRESSBUILDER is operated by using onscreen menus.

(1) Boot Selection Menu

When EXPRESSBUILDER starts from DVD or Internal Flash Memory, below menu appears.



Use the upper and lower arrow keys to move the cursor, and then press <Enter> key to select it.

Os installation (default) is selected if no key is pressed.

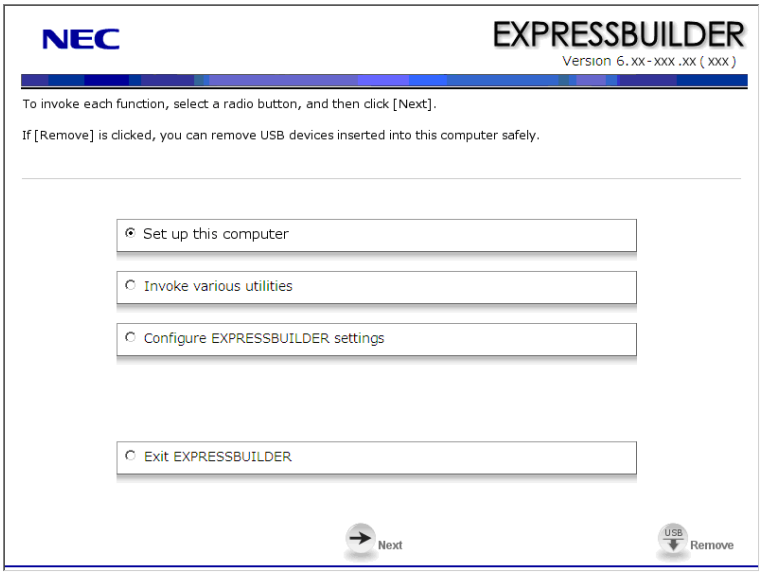
If **Os installation** is selected, Top menu shown in *(2) Top Menu* appears after confirmation of Windows PE software license.

If **Tool menu (Normal mode)** is selected, Tool Menu shown in *(3) Tool Menu* appears. The screen appears on the display. Select this mode normally.

If **Tool menu (Redirection mode)** is selected, you can operate EXPRESSBUILDER remotely by using BIOS Console Redirection. In this mode, the menu items and the tools that can be activated are the same as those in normal mode.

Tips Be sure to select normal mode when using the remote KVM feature.

(2) Top Menu


NEC
EXPRESSBUILDER
Version 6.xx-xxx.xx (xxx)
To invoke each function, select a radio button, and then click [Next].
If [Remove] is clicked, you can remove USB devices inserted into this computer safely.
Set up this computer
Invoke various utilities
Configure EXPRESSBUILDER settings
Exit EXPRESSBUILDER
Next
Remove

Tips EXPRESSBUILDER is a configuration tool and it uses Windows PE. Note that EXPRESSBUILDER automatically restarts if it is operated continuously 72 hours.

Operate Top Menu using the mouse or keyboard.

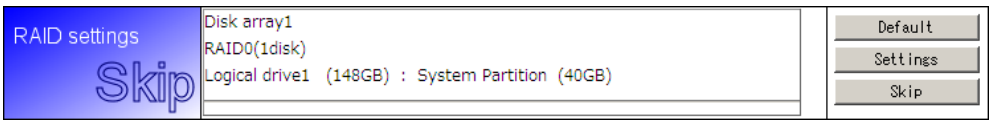
The following menus are included.

a) Set up this computer

RAID configuration and Windows installation can be performed. For details about how to install an OS, refer to "*Installation Guide (Windows)*".

Configure RAID System only

If **Configure RAID System only** is selected, only creation and modification of the RAID System is performed. Install an OS separately after setting up the RAID configuration.



- Click [Default] to reset the RAID configuration to the default values.
- Click [Settings] to launch the setup wizard and set up the RAID configuration by following the instructions on the screen.
- Click [Skip] to cancel the RAID configuration setup.

b) Invoke various utilities

Start a utility provided by EXPRESSBUILDER.

For details about the provided utilities, refer to *Chapter 2 (5.3 Utilities Provided by EXPRESSBUILDER)*.

c) Configure EXPRESSBUILDER settings

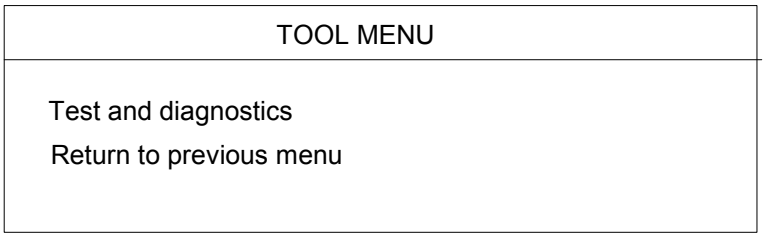
Specify EXPERSSBUILDER settings. For details about the settings, refer to *Chapter 2 (5.4 Configure EXPRESSBUILDER Settings)*.

d) Exit EXPRESSBUILDER

Select this item to exit EXPRESSBUILDER.

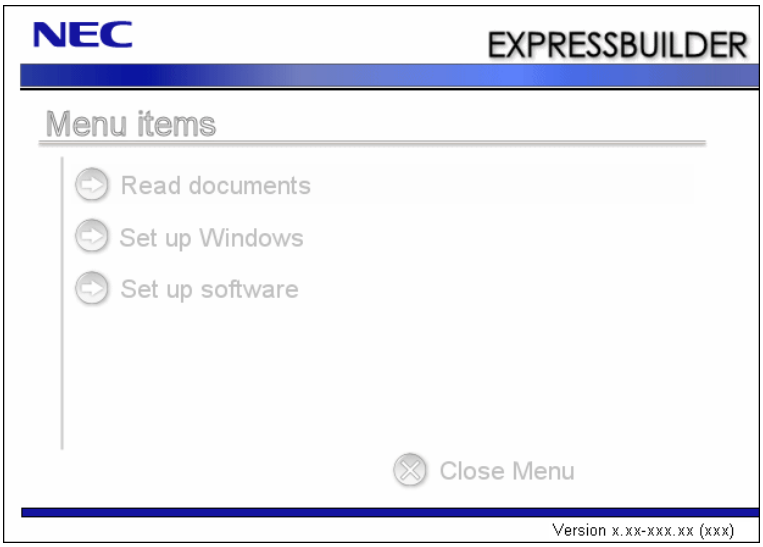
Click **Remove** icon on the lower right to safely remove the USB device connected to the server.

(3) Tool Menu



The system diagnostics, which is used to analyze and diagnose the server and check the connection, can be started from Tool Menu. For details about system diagnostics, refer to *Chapter 1 (8. System Diagnostics)*.

(4) Autorun Menu



Documents can be read and bundled software can be installed from Autorun Menu. Adobe Reader is needed to view or print documents because all documents are provided as PDF files.

If Autorun Menu does not launch, eject the DVD and then insert it again. Autorun Menu can be re-displayed by selecting **Computer(**this is **My Computer** on XP**)** from Windows Explorer and then double-clicking the drive icon of EXPRESSBUILDER DVD.

Tips The menu item **Create drivers disk** is not provided for this version. A driver disk for Windows can be created as required during the steps of **Set up this computer**.

5.3 Utilities Provided by EXPRESSBUILDER

The following utilities can be started from Top Menu (described in *Chapter 2 (5.2 Menu) - (2) Top Menu*):

(1) Install Starter Pack to installed Windows

Installs Starter Pack to the installed Windows. Starter Pack contains drivers customized to this server. Be sure to install Starter Pack before operating this server.

Note If EXPRESSBUILDER is launched from DVD, this feature is disabled. You can install Starter Pack according to *Chapter 2 (5.2 Menu - (4) Autorun Menu)*.

Tips Starter Pack is automatically installed when Windows is installed by using EXPRESSBUILDER.
If the server is a Windows preinstalled model, Starter Pack is already installed.

(2) Save or restore RAID configuration data

Saves and restores the configuration data on the RAID Controller.

The data can be saved to Internal Flash Memory if installed.

(3) Run a file directly

Directly starts a external utility stored in a removable media. **Use this function only for utilities provided by NEC**.

5.4 Configure EXPRESSBUILDER Settings

EXPRESSBUILDER Settings can be configured from Top Menu (described in *Chapter 2 (5.2 Menu) - (2) Top Menu*), as follows.

(1) Load a driver into EXPRESSBUILDER

A driver stored in a removable media can be loaded. **Use this function only for drivers provided by NEC**.

(2) Manage Internal Flash Memory

Internal Flash Memory can be managed by using commands described below.

Note The below commands are not available when EXPRESSBUILDER is started from Internal Flash Memory.

a) Confirm the connection of Internal Flash Memory

Checks if Internal Flash Memory is installed and accessible.

POST message is changed depending on the execution result of this command.

If the connection of Internal Flash Memory is recognized, the commands **b)** and **c)** below can be executed.

Connected: EXPERSSBUILDER can be started by pressing <F3> key (`<F3> Internal Flash Memory` is displayed on the screen).

Not connected: EXPERSSBUILDER cannot be started by pressing <F3> key (`<F3> Internal Flash Memory` is not displayed on the screen).

b) Initialize Internal Flash Memory

Clears the data in Internal Flash Memory and initializes (formats) it.

Be careful that **all data in Internal Flash Memory is deleted**.

c) Update Internal Flash Memory

Copies EXPRESSBUILDER from EXPRESSBUILDER DVD or other media provided by NEC to Internal Flash Memory.

The data is overwritten and **all previous data is cleared**.

Tips The parameter file and RAID configuration data are retained.

6. EXPRESSSCOPE Engine 3

EXPRESSSCOPE Engine 3 enables various functions by using a system management LSI called BMC (Baseboard Management Controller).

EXPRESSSCOPE Engine 3 monitors statuses inside the server such as that of power supplies, fans, temperature, and voltage. Connecting the management LAN port to your network enables you to do the following from a remote site via a Web browser and SSH client;

- Managing the server
- Operating* KVM (keyboard, video, and mouse) from a remote console
- Accessing* a CD-ROM, DVD ROM, floppy disk, ISO image, or USB flash drive in a remote console

* In order to activate these functions, the optional N8115-04 Remote KVM and Media License are required.

To actualize these functions, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

7. NEC ESMPRO

7.1 NEC ESMPRO Agent (for Windows)

For details of NEC ESMPRO Agent(for Windows), refer to "*NEC ESMPRO Agent Installation Guide (Windows)*" in EXPRESSBUILDER or its help.

7.2 NEC ESMPRO Manager

NEC ESMPRO Manager remotely controls and monitors the server hardware and RAID System.
To use these features, install the bundled software such as NEC ESMPRO Agent on the server.

Refer to "*NEC ESMPRO Manager Installation Guide*" or online help of NEC ESMPRO for details.

7.3 NEC ESMPRO Agent Extension

NEC ESMPRO Agent Extension allows you to manage the server remotely by this server's BMC connecting with NEC ESMPRO Manager.

For details, refer to "*NEC ESMPRO Agent Extension Installation Guide*" in EXPRESSBUILDER.

7.4 BMC Configuration

BMC Configuration enables you to specify configurations to this server's BMC.

For details, refer to "*BMC Configuration User's Guide*" in EXPRESSBUILDER.

7.5 NEC ExpressUpdate Agent

NEC ExpressUpdate Agent enables you to manage and update the versions of the firmware and software installed in this server.

By using NEC ExpressUpdate, you can install the downloaded packages easily.

For details, refer to "*NEC ExpressUpdate Agent Installation Guide*" in EXPRESSBUILDER.

Tips Updates are available for some firmware and software that do not support NEC ExpressUpdate. Refer to the following website to install these packages:
http://www.nec.com/global/prod/express/index.html

8. NEC Product Info Collection Utility

NEC Product Info Collection Utility can collect various information related to the server all at once. This utility allows you to collect server information(Product Info) for maintenance.

8.1 Usage

Execute `\stdclct\collect.exe` contained in the installation folder of this utility.

(By default, this utility has been installed to the **C:\ezclct** folder.)

The `log` folder is created in `stdclct` folder and “Product Info” is stored in a compressed (zip) file.

Tips

- Log on to Windows with an account that has an administrator privilege.
- The installation drive requires a free space of at least 2.5 GB.

9. Universal RAID Utility

Universal RAID Utility is an application to manage or monitor the following RAID Controllers.

- N8103-149 RAID Controller (512 MB, RAID 0/1)
- N8103-150 RAID Controller (512 MB, RAID 0/1/5/6)
- N8103-151 RAID Controller (1GB, RAID 0/1/5/6)
- N8103-160 RAID Controller (1GB, RAID 0/1/5/6)

For information about installing Universal RAID Utility, refer to Universal RAID Utility in "*Installation Guide (Windows)*".

Refer to "*Universal RAID Utility User's Guide*" in EXPRESSBUILDER for more information about operating instructions and functions.

9.1 Creating Logical Drive of RAID 6

You must use four or more Physical Devices to create a RAID 6 Logical Drive by using Universal RAID Utility. If you want to create a RAID 6 Logical Drive from three Physical Devices, you need to use WebBIOS.

NEC Express5800 Series
Express5800/R120d-1M, R120d-2M

3

Appendix

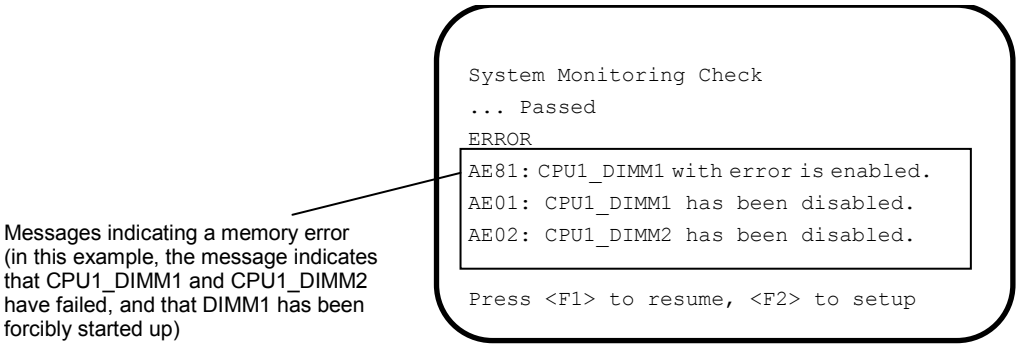
1. **POST Error Message**
   Shows a list of error messages for errors detected by a self diagnostic test called *POST*.

2. **List of Windows Event Logs**
   Shows a list of Windows event logs

3. **Accessing Data for Electrical Power, Temperature, and Processor Utilization**
   Describes how to check power consumption in watts, intake temperature, and logical processor utilizations.

1. POST Error Message

When an error is detected by POST, the display shows an error message. In addition, depending on the error contents, your server might beep to report that an error occurred.


System Monitoring Check
... Passed
ERROR
AE81: CPU1_DIMM1 with error is enabled.
AE01: CPU1_DIMM1 has been disabled.
AE02: CPU1_DIMM2 has been disabled.
Press <F1> to resume, <F2> to setup
Messages indicating a memory error (in this example, the message indicates that CPU1_DIMM1 and CPU1_DIMM2 have failed, and that DIMM1 has been forcibly started up)

The following table lists error messages and the actions to take in response to them.

Tips

- Write down the displayed messages and beep patterns before contacting your sales representative. Alarm messages are useful information for maintenance.
- The list only contains messages for the server. For details about error messages of optional devices, and the actions to take, refer to the instructions that come with each product.

(1) Error messages

Error Message		Cause	Solution
8000	System variable is corrupted.	Illegal setup information of BIOS was detected.	Start BIOS Setup Utility (SETUP), and then execute **Load Setup Defaults** and specify the necessary settings. If the same error is detected repeatedly in spite of re-setting, contact your sales representative.
8001	Real time clock error	Real time clock error was detected.	Start SETUP, and then specify the correct date and time. If the same error is detected repeatedly in spite of re-setting, contact your sales representative.
8002	Check date and time settings	Incorrect date and time set on real time clock was detected.	
8003	System battery is dead - Replace and run SETUP	The battery for storing system settings is dead.	Contact your sales representative to request a battery replacement. (After the replacement, start SETUP, and then specify the correct settings.)
8005	Previous boot incomplete - Default configuration used	The previous POST processing did not finish.	Use SETUP to specify the correct settings.
8006	System configuration data cleared by Jumper.	The setup utility settings were cleared using the jumper.	Follow the steps described in *Chapter 1 (7. Resetting and Clearing the Server).* Start SETUP, and then setup each item again. If the same error is detected repeatedly in spite of re-setting, contact your sales representative. This error message also appears when lithium battery is removed.
8007	SETUP Menu Password cleared by Jumper.	The setup utility password was cleared using the jumper.	
8020	BIOS update error.	BIOS update failed.	Try BIOS update again. If the same error is detected repeatedly, contact your sales representative.
8021	Recovery jumper is set, but recovery images is not found.	Recovery jumper is set.	Contact your sales representative.
8800	DXE_NB_ERROR	An error was detected during initialization of chipset.	
8801	DXE_NO_CON_IN	An error was detected during initialization of console.	
8802	DXE_NO_CON_OUT		
8803	PEI_DXE_CORE_NOT_FOUND	A flash ROM is corrupt.	
8804	PEI_DXEIPL_NOT_FOUND		
8805	DXE_ARCH_PROTOCOL_NOT_AVAILABLE		
8806	PEI_RESET_NOT_AVAILABLE	The system was not reset correctly.	
8807	DXE_RESET_NOT_AVAILABLE		Follow the steps described in *Chapter 1 (7. Resetting and Clearing the Server).* Start SETUP, and then setup each item again. If the same error is detected repeatedly in spite of re-setting, contact your sales representative.
8808	DXE_FLASH_UPDATE_FAILED	The Flash ROM was not written to correctly.	Contact your sales representative.
8830	PEI_RECOVERY_NO_CAPSULE	The Flash ROM was not recovered correctly.	
8831	PEI_RECOVERY_PPI_NOT_FOUND		
8832	PEI_RECOVERY_FAILED		
9000	Unsupported CPU detected	An unsupported CPU was detected.	
9001	Unsupported CPU detected on CPU #1		
9002	Unsupported CPU detected on CPU #2		
9021	Unsupported CPU Speed detected on CPU #1	A CPU of which clock speed is unsupported was detected.	
9022	Unsupported CPU Speed detected on CPU #2		

Error Message		Cause	Solution
9040	PEI_CPU_SELF_TEST_FAILED	An error was detected in CPU initialization.	Contact your sales representative.
9041	Detected CPU Error on CPU #1	An error was detected on CPU #1.	
9042	Detected CPU Error on CPU #2	An error was detected on CPU #2.	
9060	PEI_CPU_MISMATCH	CPU #1 and #2 are not the same type.	
9080	Link in Slow Speed Made between CPU1 and CPU2.	Low-speed mode was detected on bus between CPU1 and CPU2.	
9081	Link Failure between CPU1 and CPU2	Connection failure was detected on bus between CPU1 and CPU2.	
9082	Link width Error between CPU1 and CPU2	Connection decline was detected on bus width between CPU1 and CPU2.	
9E80	Forced to use CPU with error.	An error was detected in CPU, but the CPU was forcedly enabled.	
A001	Memory Error detected in CPU1_DIMM1	An error was detected in CPU1_DIMM1.	
A002	Memory Error detected in CPU1_DIMM2	An error was detected in CPU1_DIMM2.	
A003	Memory Error detected in CPU1_DIMM3	An error was detected in CPU1_DIMM3.	
A004	Memory Error detected in CPU1_DIMM4	An error was detected in CPU1_DIMM4.	
A005	Memory Error detected in CPU1_DIMM5	An error was detected in CPU1_DIMM5.	
A006	Memory Error detected in CPU1_DIMM6	An error was detected in CPU1_DIMM6.	
A007	Memory Error detected in CPU1_DIMM7	An error was detected in CPU1_DIMM7.	
A008	Memory Error detected in CPU1_DIMM8	An error was detected in CPU1_DIMM8.	
A009	Memory Error detected in CPU1_DIMM9	An error was detected in CPU1_DIMM9.	
A00A	Memory Error detected in CPU1_DIMM10	An error was detected in CPU1_DIMM10.	
A00B	Memory Error detected in CPU1_DIMM11	An error was detected in CPU1_DIMM11.	
A00C	Memory Error detected in CPU1_DIMM12	An error was detected in CPU1_DIMM12.	
A00D	Memory Error detected in CPU2_DIMM1	An error was detected in CPU2_DIMM1.	
A00E	Memory Error detected in CPU2_DIMM2	An error was detected in CPU2_DIMM2.	
A00F	Memory Error detected in CPU2_DIMM3	An error was detected in CPU2_DIMM3.	
A010	Memory Error detected in CPU2_DIMM4	An error was detected in CPU2_DIMM4.	
A011	Memory Error detected in CPU2_DIMM5	An error was detected in CPU2_DIMM5.	
A012	Memory Error detected in CPU2_DIMM6	An error was detected in CPU2_DIMM6.	
A013	Memory Error detected in CPU2_DIMM7	An error was detected in CPU2_DIMM7.	
A014	Memory Error detected in CPU2_DIMM8	An error was detected in CPU2_DIMM8.	

Error Message		Cause	Solution
A015	Memory Error detected in CPU2_DIMM9	An error was detected in CPU2_DIMM9.	Contact your sales representative.
A016	Memory Error detected in CPU2_DIMM10	An error was detected in CPU2_DIMM10.	
A017	Memory Error detected in CPU2_DIMM11	An error was detected in CPU2_DIMM11.	
A018	Memory Error detected in CPU2_DIMM12	An error was detected in CPU2_DIMM12.	
AE01	CPU1_DIMM1 has been disabled.	A memory error was detected. CPU1_DIMM1 has been disabled.	
AE02	CPU1_DIMM2 has been disabled.	A memory error was detected. CPU1_DIMM2 has been disabled.	
AE03	CPU1_DIMM3 has been disabled.	A memory error was detected. CPU1_DIMM3 has been disabled.	
AE04	CPU1_DIMM4 has been disabled.	A memory error was detected. CPU1_DIMM4 has been disabled.	
AE05	CPU1_DIMM5 has been disabled.	A memory error was detected. CPU1_DIMM5 has been disabled.	
AE06	CPU1_DIMM6 has been disabled.	A memory error was detected. CPU1_DIMM6 has been disabled.	
AE07	CPU1_DIMM7 has been disabled.	A memory error was detected. CPU1_DIMM7 has been disabled.	
AE08	CPU1_DIMM8 has been disabled.	A memory error was detected. CPU1_DIMM8 has been disabled.	
AE09	CPU1_DIMM9 has been disabled.	A memory error was detected. CPU1_DIMM9 has been disabled.	
AE0A	CPU1_DIMM10 has been disabled.	A memory error was detected. CPU1_DIMM10 has been disabled.	
AE0B	CPU1_DIMM11 has been disabled.	A memory error was detected. CPU1_DIMM11 has been disabled.	
AE0C	CPU1_DIMM12 has been disabled.	A memory error was detected. CPU1_DIMM12 has been disabled.	
AE0D	CPU2_DIMM1 has been disabled.	A memory error was detected. CPU2_DIMM1 has been disabled.	
AE0E	CPU2_DIMM2 has been disabled.	A memory error was detected. CPU2_DIMM2 has been disabled.	
AE0F	CPU2_DIMM3 has been disabled.	A memory error was detected. CPU2_DIMM3 has been disabled.	
AE10	CPU2_DIMM4 has been disabled.	A memory error was detected. CPU2_DIMM4 has been disabled.	
AE11	CPU2_DIMM5 has been disabled.	A memory error was detected. CPU2_DIMM5 has been disabled.	
AE12	CPU2_DIMM6 has been disabled.	A memory error was detected. CPU2_DIMM6 has been disabled.	
AE13	CPU2_DIMM7 has been disabled.	A memory error was detected. CPU2_DIMM7 has been disabled.	
AE14	CPU2_DIMM8 has been disabled.	A memory error was detected. CPU2_DIMM8 has been disabled.	

Error Message		Cause	Solution
AE15	CPU2_DIMM9 has been disabled.	A memory error was detected. CPU2_DIMM9 has been disabled.	Contact your sales representative.
AE16	CPU2_DIMM10 has been disabled.	A memory error was detected. CPU2_DIMM10 has been disabled.	
AE17	CPU2_DIMM11 has been disabled.	A memory error was detected. CPU2_DIMM11 has been disabled.	
AE18	CPU2_DIMM12 has been disabled.	A memory error was detected. CPU2_DIMM12 has been disabled.	
AE81	CPU1_DIMM1 with error is enabled.	An error in CPU1_DIMM1 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE82	CPU1_DIMM2 with error is enabled.	An error in CPU1_DIMM2 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE83	CPU1_DIMM3 with error is enabled.	An error in CPU1_DIMM3 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE84	CPU1_DIMM4 with error is enabled.	An error in CPU1_DIMM4 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE85	CPU1_DIMM5 with error is enabled.	An error in CPU1_DIMM5 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE86	CPU1_DIMM6 with error is enabled.	An error in CPU1_DIMM6 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE87	CPU1_DIMM7 with error is enabled.	An error in CPU1_DIMM7 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE88	CPU1_DIMM8 with error is enabled.	An error in CPU1_DIMM8 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE89	CPU1_DIMM9 with error is enabled.	An error in CPU1_DIMM9 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE8A	CPU1_DIMM10 with error is enabled.	An error in CPU1_DIMM10 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE8B	CPU1_DIMM11 with error is enabled.	An error in CPU1_DIMM11 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE8C	CPU1_DIMM12 with error is enabled.	An error in CPU1_DIMM12 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE8D	CPU2_DIMM1 with error is enabled.	An error in CPU2_DIMM1 occurred, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE8E	CPU2_DIMM2 with error is enabled.	An error in CPU2_DIMM2 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE8F	CPU2_DIMM3 with error is enabled.	An error in CPU2_DIMM3 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	

Error Message		Cause	Solution
AE90	CPU2_DIMM4 with error is enabled.	An error in CPU2_DIMM4 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	Contact your sales representative.
AE91	CPU2_DIMM5 with error is enabled.	An error in CPU2_DIMM5 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE92	CPU2_DIMM6 with error is enabled.	An error in CPU2_DIMM6 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE93	CPU2_DIMM7 with error is enabled.	An error in CPU2_DIMM7 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE94	CPU2_DIMM8 with error is enabled.	An error in CPU2_DIMM8 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE95	CPU2_DIMM9 with error is enabled.	An error in CPU2_DIMM9 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE96	CPU2_DIMM10 with error is enabled.	An error in CPU2_DIMM10 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE97	CPU2_DIMM11 with error is enabled.	An error in CPU2_DIMM11 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
AE98	CPU2_DIMM12 with error is enabled.	An error in CPU2_DIMM12 was detected, but because all memory is currently disabled, this DIMM was forcibly enabled.	
B000	Expansion ROM not initialized	Failed to expand option ROM.	Disable expansion of option ROM of the board that is not used for OS boot.
B001	Expansion ROM not initialized - PCI Slot 1B	Option ROM expansion in PCI slot 1B failed.	Disable expansion of option ROM of the option board that is not used for OS boot. Run SETUP, and select **Advanced** → **PCI Configuration** → **PCI Device Controller and Option ROM Settings** → **PCIxx Slot Option ROM** → **Disabled**. (xx: PCI slot number)
B002	Expansion ROM not initialized - PCI Slot 2B	Option ROM expansion in PCI slot 2B failed.	
B003	Expansion ROM not initialized - PCI Slot 1C	Option ROM expansion in PCI slot 1C failed.	
B004	Expansion ROM not initialized - PCI Slot 2C	Option ROM expansion in PCI slot 2C failed.	
B005	Expansion ROM not initialized - PCI Slot 3C	Option ROM expansion in PCI slot 3C failed.	
B006	Expansion ROM not initialized - PCI Slot 1D	Option ROM expansion in PCI slot 1D failed.	
B01A	Expansion ROM not initialized - PCI Slot 1A	Option ROM expansion in PCI slot 1A failed.	
B022	Serial Port Configuration Overlapped.	Overlapping serial port configuration was detected.	Start SETUP, select **Advanced** → **Serial Port Configuration**, and specify the setting again in a way that the values of Base I/O or Interrupt in **Serial Port A** and **Serial Port B** will not be the same.

Error Message		Cause	Solution
B030	PCI System Error on Bus/Device/Function	PCI SERR was detected.	Contact your sales representative.
B040	PCI Parity Error on Bus/Device/Function	PCI PERR was detected.	
B201	Onboard LAN 1 - PCIe Link Failure	Connection failure of PCIe bus was detected on onboard LAN1.	
B202	Onboard LAN 2 - PCIe Link Failure	Connection failure of PCIe bus was detected on onboard LAN2.	
B211	PCI Slot 1A - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 1A.	
B212	PCI Slot 1B - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 1B.	
B213	PCI Slot 2B - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 2B.	
B215	PCI Slot 1C - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 1C.	
B216	PCI Slot 2C - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 2C.	
B217	PCI Slot 3C - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 3C.	
B218	PCI Slot 1D - PCIe Link Failure	Connection failure of PCIe bus was detected on PCI slot 1D.	
B221	Onboard LAN 1 - PCIe Link Width Error	Link Width error was detected on onboard LAN1.	
B222	Onboard LAN 2 - PCIe Link Width Error	Link Width error was detected on onboard LAN2.	
B231	PCI Slot 1A - PCIE Link Width Error	A Link Width error was detected in PCI Slot 1A.	
B232	PCI Slot 1B - PCIE Link Width Error	A Link Width error was detected in PCI Slot 1B.	
B233	PCI Slot 2B - PCIE Link Width Error	A Link Width error was detected in PCI Slot 2B.	
B234	PCI Slot 1C - PCIE Link Width Error	A Link Width error was detected in PCI Slot 1C.	
B235	PCI Slot 2C - PCIE Link Width Error	A Link Width error was detected in PCI Slot 2C.	
B236	PCI Slot 3C - PCIE Link Width Error	A Link Width error was detected in PCI Slot 3C.	
B237	PCI Slot 1D - PCIE Link Width Error	A Link Width error was detected in PCI Slot 1D.	
B261	Onboard LAN 1 - PCIe Link Speed Error	Link Speed error was detected on onboard LAN1.	
B262	Onboard LAN 2 - PCIe Link Speed Error	Link Speed error was detected on onboard LAN2.	
B271	PCI Slot 1A - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 1A.	
B272	PCI Slot 1B - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 1B.	
B273	PCI Slot 2B - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 2B.	
B275	PCI Slot 1C - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 1C.	
B276	PCI Slot 2C - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 2C.	
B277	PCI Slot 3C - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 3C.	

Error Message		Cause	Solution
B278	PCI Slot 1D - PCIe Link Speed Error	Link Speed error was detected on PCI Slot 1D.	Contact your sales representative.
C000	The error occurred during fan sensor reading.	An error was detected while reading fan sensor.	
C010	The error occurred during temperature sensor reading	An error was detected while reading temperature sensor.	
C011	System Temperature out of the range.	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative.
C020	The error occurred during voltage sensor reading.	An error was detected while reading voltage sensor.	Contact your sales representative.
C021	System Voltage out of the range.	A system voltage abnormality was detected.	
C040	SROM data read error	An error was detected while reading data on SROM.	
C061	1st SMBus device Error detected.	An error was detected on 1st SM Bus.	
C062	2nd SMBus device Error detected.	An error was detected on 2nd SM Bus.	
C063	3rd SMBus device Error detected.	An error was detected on 3rd SM Bus.	
C064	4th SMBus device Error detected.	An error was detected on 4th SM Bus.	
C065	5th SMBus device Error detected.	An error was detected on 5th SM Bus.	
C066	6th SMBus device Error detected.	An error was detected on 6th SM Bus.	
C067	7th SMBus device Error detected.	An error was detected on 7th SM Bus.	
C068	8th SMBus device Error detected.	An error was detected on 8th SM Bus.	
C101	BMC Memory Test Failed.	An error was detected on BMC.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C102	BMC Firmware Code Area CRC check Failed.		
C103	BMC core hardware failure.		
C104	BMC IBF or OBF check failed.	An error was detected while accessing BMC.	
C105	BMC SEL area full.	There is not enough space to store the system event log.	Start up Offline Tools (*Chapter 1, 9. Offline Tools*) and delete the event logs.
C10C	BMC update firmware corrupted.	An illegality was detected while updating BMC firmware.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C10D	Internal Use Area of BMC FRU corrupted.	An illegality was detected in FRU containing the device information.	
C10E	BMC SDR Repository empty.	An error was detected on BMC SDR.	
C10F	IPMB signal lines do not respond.	Failure of Satellite Management Controller was detected.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C110	BMC FRU device failure.	An error was detected in FRU that contains device information.	
C111	BMC SDR Repository failure.	Failure was detected in SROM that stores the SDR.	
C112	BMC SEL device failure.	Device failure was detected in BMC SEL.	
C113	BMC RAM test error.	An error was detected in BMC RAM.	
C114	BMC Fatal hardware error.	A hardware error was detected in BMC.	

Error Message		Cause	Solution
C115	Management controller not responding	Management controller does not respond.	Update the BMC firmware. If the same error is detected repeatedly, contact your sales representative.
C116	Private I2C bus not responding.	Private I2C bus does not respond.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C117	BMC internal exception	BMC internal error was detected.	
C118	BMC A/D timeout error.	BMC A/D timeout error was detected.	
C119	SDR repository corrupt.	BMC error or illegal SDR data was detected.	
C11A	SEL corrupt.	BMC error or illegal system event log data was detected.	
C11B	BMC Mezzanine card is not found.	BMC Mezzanine card is not installed.	Contact your sales representative.
C11C	BMC Mezzanine partition is invalid.	A format error was detected in BMC Mezzanine card.	
C11D	BMC is in Forced Boot Mode.	Detected that BMC is in Forced Boot Mode.	Unplug the power cord, wait for at least 30 seconds, then restart the server. At that time, check the jumper switch setting on motherboard. If the same error is detected repeatedly, contact your sales representative.
C300	Out-of-band setup configuration failure	An error was detected while accessing BMC Mezzanine card.	Unplug the power cord, wait for at least 30 seconds, then restart the server. If the same error is detected repeatedly, contact your sales representative.
C301	SDR mismatch error	Inconsistency in the hardware information of the sensor data record was detected	Contact your sales representative.
C310	Hardware configuration of cooling is insufficient.	Detected that cooling power is insufficient in this hardware configuration.	
C320	Unmatched PSUs.	Unmatched power supply units are configured.	
C321	System power consumption is out-of-range in PSUs.	System power consumption exceeds the power output capacity limit.	
C322	No information for system power consumption check.	No information is acquired in checking system power consumption.	
C501	ME is in Recovery Mode.	Node Manager is in Recovery Mode.	Unplug the power cord, wait for at least 30 seconds, then restart the server. At that time, check the jumper switch setting on motherboard. If the same error is detected repeatedly, contact your sales representative.

(2) Error reporting via beep

Even if an error is detected by POST, the error message may be unable to be displayed in the display. In this case, the server beeps to report that an error has occurred.

For example, the beep code 1-3-3-1 indicates 1 beep, a pause, 3 beeps, a pause, 3 beeps, a pause, and 1 beep, which means that an error occurred while checking the memory capacity.

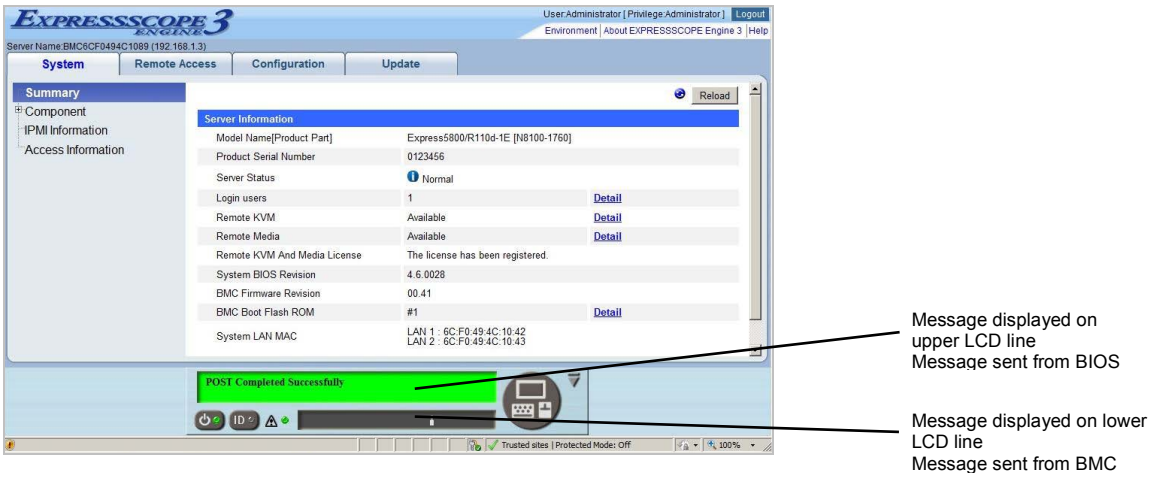
The table below shows the beep code, cause, and solution.

Beep Code	Cause	Solution
1-3-3-1	No memory module is not installed. Or, no memory is detected.	Make sure that the DIMMs are correctly inserted. If the same error is detected repeatedly, ask your sales representative to replace DIMM or motherboard.
1-5-2-1	The processor is not installed. Or, no processor is detected.	Make sure that the processor is correctly mounted. If the same error is detected repeatedly, ask your sales representative to replace DIMM or motherboard.
1-1	No graphics controller could be detected.	Contact your sales representative.
1	POST detected an error.	
3	Failed to read BIOS data. Or, failed to execute BIOS.	
4	Failed to initialize the BIOS executable module.	
7	Failed to reset the system.	
8	An error was detected when allocating the PCI resources.	Remove all the installed PCI boards to PCI slots, and then reboot the server. If the same error is detected repeatedly, contact your sales representative.

(3) Error messages on a virtual LCD

In EXPRESSSCOPE Engine 3 web browser window, you can confirm virtual LCD error messages (for details on the virtual LCD, refer to "*EXPRESSSCOPE Engine 3 User's Guide*").

The table below shows the error messages displayed on upper and lower lines, cause, and solution.



- **Messages displayed on an upper LCD line**

BIOS Message on Upper LCD Line	Cause	Solution
XX POST Started	Displayed while POST is running. "XX" denotes POST code that is running.	This is not an error.
XX BIOS Rev YYYY	Displayed while POST is running. "XX" denotes POST code that is running, and "YYYY" denotes system BIOS version.	
POST Completed Successfully	Displayed when POST completes normally.	
POST ERROR XXXX	Error XXXX was detected during POST.	Check the message displayed on LCD, and take an appropriate action.
No Available Memory in System	No available memory is implemented.	Make sure that the memory is correctly implemented.
Error Pause in POST	POST detected an error and paused.	Check the message displayed on LCD, and take an appropriate action.
Entering BIOS SETUP MENU	Starting up BIOS SETUP MENU.	This is not an error. This message will disappear when SETUP operation is completed.
Waiting for normal temperature	A temperature abnormality was detected inside the server.	Lower the room temperature or turn off the power to cool the server to room temperature before starting up the server. If this abnormality continues to occur, check if a fan has failed. If the same error still continues to occur, contact your representative.
BIOS Recovery Running	BIOS recovery is in progress.	This is not an error. Wait until BIOS update is completed.
BIOS Updater Running	BIOS update is in progress.	
System Configuration change is detected	The CPU or memory configuration has changed since the previous startup.	If this message appears even when no configuration change has been made, contact your sales representative
PCI Bus System Error 1	A system error was detected in PCI bus.	Contact your sales representative.
PCI Bus Parity Error 1	A parity error was detected in PCI bus.	
CPUx_DIMMx Correctable Error (x: DIMM number)	A frequent occurrence of correctable memory error was detected.	
Memory DIMM Sparing Fail-over on CPUx (x: CPU socket number)	Memory Sparing feature failed over to standby memory.	
Memory Mirroring Fail-over on CPUx (x: socket number)	Memory Mirroring feature failed over to standby memory.	

- **Messages displayed on a lower LCD line**

BMC Message on Lower LCD Line	Cause	Solution
Processor1 Voltage Lower Non-Critical	A voltage abnormality was detected.	Contact your sales representative.
Processor1 Voltage Upper Non-Critical		
Processor1 Voltage Lower Critical		
Processor1 Voltage Upper Critical		
Processor2 Voltage Lower Non-Critical		
Processor2 Voltage Upper Non-Critical		
Processor2 Voltage Lower Critical		
Processor2 Voltage Upper Critical		
BaseBoard Voltage Lower Non-Critical		
BaseBoard Voltage Upper Non-Critical		
BaseBoard Voltage Lower Critical		
BaseBoard Voltage Upper Critical		
VBAT Lower Non-Critical		
VBAT Upper Non-Critical		
VBAT Lower Critical		
VBAT Upper Critical		
Baseboard Temperature1 Lower Non-Critical	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative and request repairs.
Baseboard Temperature1 Upper Non-Critical		
Baseboard Temperature1 Lower Critical		
Baseboard Temperature1 Upper Critical		
Baseboard Temperature2 Lower Non-Critical		
Baseboard Temperature2 Upper Non-Critical		
Baseboard Temperature2 Lower Critical		

BMC Message on Lower LCD Line	Cause	Solution
Baseboard Temperature2 Upper Critical	A temperature abnormality was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative and request repairs.
Ambient Temperature Lower Non-Critical		
Ambient Temperature Upper Non-Critical		
Ambient Temperature Lower Critical		
Ambient Temperature Upper Critical		
CPU1-DIMM Area Temperature Lower Non-Critical		
CPU1-DIMM Area Temperature Upper Non-Critical		
CPU1-DIMM Area Temperature Lower Critical		
CPU1-DIMM Area Temperature Upper Critical		
CPU2-DIMM Area Temperature Lower Non-Critical		
CPU2-DIMM Area Temperature Upper Non-Critical		
CPU2-DIMM Area Temperature Lower Critical		
CPU2-DIMM Area Temperature Upper Critical		
Processor1 Thermal Control Upper Non-Critical		
Processor1 Thermal Control Upper Critical		
Processor2 Thermal Control Upper Non-Critical		
Processor2 Thermal Control Upper Critical		
DUMP Request !	The dump button was pressed.	Wait until collecting the memory dump data has finished.
OS shutdown Alm	An OS stop error occurred.	Record the displayed message, wait until collecting the memory dump data has finished, and then contact your sales representative and request repairs.
Power Supply1 Failure detected	A power supply unit abnormality occurred.	Make sure that the power cord is plugged in. If this does not resolve the problem, contact your sales representative and request repairs.
Power Supply2 Failure detected		
Processor Missing	No CPU is installed.	Contact your sales representative and request CPU or motherboard replacement.

BMC Message on Lower LCD Line	Cause	Solution
Processor1 Thermal Trip	The power was forcibly turned off due to a CPU temperature abnormality.	Contact your sales representative.
Processor2 Thermal Trip		
Chip Set Thermal Trip	The power was forcibly turned off due to an abnormal temperature of chipset.	
CPU1-DIMM1 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM1.	
CPU1-DIMM2 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM2.	
CPU1-DIMM3 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM3.	
CPU1-DIMM4 Uncorrectable Error	An uncorrectable error occurred for CPU1-DIMM4.	
CPU1-DIMM5 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM5.	
CPU1-DIMM6 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM6.	
CPU1-DIMM7 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM7.	
CPU1-DIMM8 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM8.	
CPU1-DIMM9 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM9.	
CPU1-DIMM10 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM10.	
CPU1-DIMM11 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM11.	
CPU1-DIMM12 Uncorrectable Error	An unrecoverable error occurred for CPU1-DIMM12.	
CPU2-DIMM1 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM1.	
CPU2-DIMM2 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM2.	
CPU2-DIMM3 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM3.	
CPU2-DIMM4 Uncorrectable Error	An uncorrectable error occurred for CPU2-DIMM4.	
CPU2-DIMM5 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM5.	
CPU2-DIMM6 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM6.	
CPU2-DIMM7 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM7.	
CPU2-DIMM8 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM8.	
CPU2-DIMM9 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM9.	

BMC Message on Lower LCD Line	Cause	Solution
CPU2-DIMM10 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM10.	Contact your sales representative.
CPU2-DIMM11 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM11.	
CPU2-DIMM12 Uncorrectable Error	An unrecoverable error occurred for CPU2-DIMM12.	
Processor1 Internal Error	An internal CPU error (IERR) occurred.	
Processor2 Internal Error		
Sensor Failure Detected.	Abnormality in a sensor was detected.	
SMI timeout	A timeout occurred while servicing system management interrupts.	
IPMI Watchdog timer timeout (Power off)	A watchdog timer timeout occurred.	
Node Manager Firmware Image execution Failed	Abnormality in Node Manager occurred.	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your sales representative.
Node Manager Firmware Flash Erase Error		
Node Manager Firmware Flash Corrupted		
Node Manager Firmware Flash Corrupted	Abnormality in Node Manager occurred.	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your sales representative.
Node Manager Internal Error		
Node Manager can't communicate BMC		
Node Manager Firmware Image execution Failed		
Node Manager Firmware Flash Erase Error		
Node Manager Firmware Flash Corrupted		
Node Manager Internal Error		
Node Manager can't communicate BMC		
Node Manager Manufacturing Error		
Node Manager Persistent Storage Integrity Error		
Drive 0 Fault	Operation was performed during hard disk drive failure	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your sales representative.
Drive 1 Fault		
Drive 2 Fault		
Drive 3 Fault		
Drive 4 Fault		
Drive 5 Fault		
Drive 6 Fault		

BMC Message on Lower LCD Line	Cause	Solution
Drive 7 Fault	Operation was performed during hard disk drive failure	Turn off the power, wait for about 30 seconds, and restart the server. If this does not resolve the problem, contact your sales representative.
Drive 8 Fault		
Drive 9 Fault		
Drive 10 Fault		
Drive 11 Fault		
Drive 12 Fault		
Drive 13 Fault		
Drive 14 Fault		
Drive 15 Fault		
System Rear FAN1 Lower Non-Critical	A fan alarm was detected.	It is possible that a fan has failed or is clogged. Contact your sales representative and request repairs.
System Rear FAN2 Lower Non-Critical		
System Rear FAN3 Lower Non-Critical		
System Rear FAN4 Lower Non-Critical		
System Rear FAN5 Lower Non-Critical		
System Rear FAN6 Lower Non-Critical		
System Rear FAN7 Lower Non-Critical		
System Rear FAN8 Lower Non-Critical		
System Front FAN1 Lower Non-Critical		
System Front FAN2 Lower Non-Critical		
System Front FAN3 Lower Non-Critical		
System Front FAN4 Lower Non-Critical		
System Front FAN5 Lower Non-Critical		
System Front FAN6 Lower Non-Critical		
System Front FAN7 Lower Non-Critical		
System Front FAN8 Lower Non-Critical		

2. List of Windows Event Logs

ID	Source	Type	Message (Description)
	Timing		Action

System Event Log for all Windows OS			
51	Cdrom	Warning	Error detected on the device \Device\CdRom0 during the paging operation.
	Upon OS installation		This event may be registered in the event viewer, but this does not affect system operation.

System Event Log for Windows Server 2008 R2			
1	iScsiPrt	Error	Initiator failed to connect to the target. Target IP address and TCP Port number are given in dump data.
	When Windows Server 2008 R2 is operating while iSCSI is recognized		Go to the following Microsoft website for details. http://support.microsoft.com/kb/976072/en-us
4	b57nd60a	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
	l2nd	Warning	Broadcom BCM57711 #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
11	Disk	Error	The driver detected a controller error on Device\Harddisk*X*\DR*X*. **Note**: A different number replaces *X* depending on the connection status of the disk.
	Upon connecting with a USB device, remote media, and/or Virtual Flash USB Device		When the below values are 00 in **Details in the event logs** → **Display**, this event does not affect system operation. <Word style> 0000: 0068030E 00000001 00000000 C004000B 0008: 00000103 00000000 00000000 002D0800 0010: 00000000 00000000 000427B7 00000000 0018: FFFFFFFF 00000006 00000040 00000000 0020: 12060000 10000008 00000000 0000003C 0028: 00000000 86BAA280 00000000 86BDB008 0030: 00000000 00000000 00000000 00000000 0038: 00000000 00000000 00000000 00000000 0040: 00000000 00000000 00000000 00000000 0048: 00000000 00000000 00000000 00000000 0050: 00000000 00000000 <Byte style> 0000: 0E 03 68 00 01 00 00 00 ..h..... 0008: 00 00 00 00 0B 00 04 C0 ....A 0010: 03 01 00 00 00 00 00 00 .... 0018: 00 00 00 00 00 08 2D 00 ......-. 0020: 00 00 00 00 00 00 00 00 .... 0028: B7 27 04 00 00 00 00 00 ? '...... 0030: FF FF FF FF 06 00 00 00 yyyy.... 0038: 40 00 00 00 00 00 00 00 @....... 0040: 00 00 06 12 08 00 00 10 .... 0048: 00 00 00 00 3C 00 00 00 ....<... 0050: 00 00 00 00 80 A2 BA 86 ....?¢o? 0058: 00 00 00 00 08 B0 BD 86 .....°?? 0060: 00 00 00 00 00 00 00 00 .... 0068: 00 00 00 00 00 00 00 00 .... 0070: 00 00 00 00 00 00 00 00 .... 0078: 00 00 00 00 00 00 00 00 .... 0080: 00 00 00 00 00 00 00 00 .... 0088: 00 00 00 00 00 00 00 00

ID	Source	Type	Message (Description)
	Timing		Action
System Event Log for Windows Server 2008 R2			
134	Microsoft-Windows-Time-Service	Warning	NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on''. NtpClient will try again in 3473457 minutes and double the reattempt interval thereafter. The error was: No such host is known. (0x80072AF9)
	Upon OS Installation		This event does not affect system operation.
1004	IPMIDRV	Warning	The IPMI device driver attempted to communicate with the IPMI BMC device during normal operation. However the communication failed due to a timeout. You can increase the timeouts associated with the IPMI device driver.
	When you operate Windows Server 2008 R2		The above event log may be recorded. Usually, however, IPMI command retry processing is performed, so there is no operation problem.

ID	Source	Type	Message (Description)
	Timing		Action

Application Event Log for Windows Server 2008 R2			
1015	Microsoft-Windows-Security-SPP	Warning	Description: Detailed information of HRESULT Returned hr=0xC004F022, original hr=0x80049E00
	Upon OS Installation		Unless the application event is registered after license authentication, this event does not affect system operation.
1534	Microsoft-Windows-User Profiles Service	Warning	Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is The revision level is unknown.
	Upon OS Installation		Unless the application event is registered after license authentication, this event does not affect system operation.
8193	VSS	Error	Volume Shadow Copy Service error: Unexpected error calling routine IOCTL_DISK_GET_DRIVE_LAYOUT_EX(\\?\mpio#disk&ven_nec&prod_istorage_2000&rev_2800#1&7f6ac24&0&3030303030303039333130303037353730303239 34#{ GUID }) - BuildLunInfoForDrive. hr = 0x80070013, This media is write-protected.
	When you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003016/en-us
12289	VSS	Error	Unexpected error DeviceIoControl(\\?\storage#volume#_??_mpio#disk&ven_nec&prod_istorage_1000&rev_1000#1&7f6ac24&0&30303030303030313030303030323830303046 36#{ GUID}#0000000000007 e00#{ GUID }-00000000000002B8, x00560000,0000000000000000,0,00000000004866D0,4096,[0]). hr = 0x80070013, This media is read-only volume.
	When you import a transportable shadow-copy to another server that has a read-only volume while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003016/en-us
12289	VSS	Error	Volume shadow copy service error: unexpected error DeviceIoControl (\\?\fdc#generic_floppy_drive#6&6a032c4&0 &0 #{ GUID }-00000000000002B0,0x00560000, 0000000000000000,0,00000000001EC0E0,4096,[0]). hr = 0x80070001, function is incorrect.
	When you import a transportable shadow-copy to another server that has a floppy disk drive while operating Windows Server 2008 R2:		Go to the following Microsoft website for details: http://support.microsoft.com/kb/2003968/en-us

ID	Source	Type	Message (Description)
	Timing		Action

Applications and Services Logs for Windows Server 2008 R2			
Microsoft-Windows-Kernel-EventTracing/Admin			
2	Microsoft-Windows-Kernel-EventTracing	Error	Session "" failed to start with the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.
3	Microsoft-Windows-Kernel-EventTracing	Error	Session "Microsoft-Windows-Setup" stopped due to the following error: 0xC000000D
	When running an OS for the first time		This event does not affect system operation.
Microsoft-Windows-Dhcp-Client/Admin			
1001	Microsoft-Windows-Dhcp-Client	Error	Your computer was not assigned an address from the network (by the DHCP Server) for the Network Card with network address 0x50E549A98325. The following error occurred: 0x79. Your computer will continue to try and obtain an address on its own from the network address (DHCP) server.
	When installing an OS, running an OS for the first time, or applying Starter Pack		If this event is logged when installing an OS, running an OS for the first time, or while applying Starter Pack, it does not affect system operation.

ID	Source	Type	Message (Description)
	Timing		Action

System Event Log for Windows Server 2008			
4	• For Windows Server 2008 x64: `b57nd60a` • For Windows Server 2008 x32: `b57nd60x`	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
	`l2nd`	Warning	Broadcom BCM57711 #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
5	`Storflt`	Warning	The Virtual Storage Filter Driver is disabled through the registry. It is inactive for all disk drives.
	Upon OS Installation		This event does not affect system operation.
10	`VDS Dynamic Provider`	Error	The provider failed while storing notifications from the driver. The Virtual Disk Service should be restarted. hr=80042505
	Upon OS Installation		Go to the following Microsoft website for details: http://support.microsoft.com/kb/948275/en-us
134	`Microsoft-Windows-Time-Service`	Warning	NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on 'time.windows.com,0x9'. NtpClient will try again in 15 minutes and double the reattempt interval thereafter. The error was: No such host is known. (0x80072AF9)
	Upon OS Installation		This event does not affect system operation.
263	`PlugPlayManager`	Warning	The service `ShellHWDetection` may not have unregistered for device event notifications before it was stopped.
	Upon OS Installation		This event does not affect system operation.
1004	`IPMIDRV`	Warning	The IPMI device driver attempted to communicate with the IPMI BMC device during normal operation. However the communication failed due to a timeout. You can increase the timeouts associated with the IPMI device driver.
	When the system is used.		The above event log may be recorded. Usually, however, IPMI command retry processing is performed, so there is no operation problem.
1021	`Microsoft-Windows-Security-Licensing-SLC`	Warning	SLUINotify service has failed to start. hr=0x80070424
	Upon OS Installation		Execute the license authentication from the license authentication screen.
1534	`Microsoft-Windows-User Profiles Service`	Warning	Profile notification of event Create for component {56EA1054-1959-467f-BE3B-A2A787C4B6EA} failed, error code is -2147023591
	Upon OS Installation		The event may be registered at logon. This event does not affect system operation.
2505	`Server`	Error	The server could not bind to the transport \Device\NetBT_Tcpip_{7A71FB4F-0E8F-4E19-9B14-A6845259AAD6} because another computer on the network has the same name. The server could not start.
	Upon OS Installation		This does not affect system operation.
4307	`NetBT`	Error	Initialization failed because the transport refused to open initial addresses.
	Upon OS Installation		This event log does not affect system operation unless it occurs often.

ID	Source	Type	Message (Description)
	Timing		Action

System Event Log for Windows Server 2008			
7000	Service Control Manager	Error	The Parallel port driver service failed to start due to the following error: The service cannot be started, either because it is disabled or because it has no enabled devices associated with it.
	Upon OS Installation		This event does not affect system operation.
15016	Microsoft-Windows-HttpEvent	Error	Unable to initialize the security package Kerberos for server side authentication. The data field contains the error number.
	Upon OS Installation		This event does not affect system operation.

Application Event Log for Windows Server 2008			
63	Microsoft-Windows-WMI	Warning	A provider, Ncs2, has been registered in the Windows Management Instrumentation namespace Root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. A provider, IntelEthernetDiag, has been registered in the Windows Management Instrumentation namespace Root\CIMv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. A provider, WmiPerfClass, has been registered in the Windows Management Instrumentation namespace root\cimv2 to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon OS Installation		This event does not affect system operation.
1020	EvntAgnt	Error	processing registry parameters. Extension agent terminating.
	Upon OS Installation		This event does not affect system operation.
1054	Security-Licensing-SLC	Warning	Component error. hr=0x80049E00, [4, 3]
	Upon OS Installation		This event does not affect system operation.
1500	SNMP	Error	The SNMP Service encountered an error while accessing the registry key SYSTEM\CurrentControlSet\Services\SNMP\Parameters\PermittedManagers.
	Upon OS Installation		This event does not affect system operation.
2019	EvntAgnt	Error	SNMP Event Log Extension Agent did not initialize correctly.
	Upon OS Installation		This event does not affect system operation.
3001	EvntAgnt	Warning	Log file not positioned at end.
	Upon OS Installation		This event does not affect system operation.
3003	EvntAgnt	Warning	Error positioning to end of log file -- can't get oldest log record. Handle specified is 17891340. Return code from GetOldestEventLogRecord is 223.
	Upon OS Installation		This event does not affect system operation.
6000	Microsoft-Windows-Winlogon	Warning	The winlogon notification subscriber <GPClient> was unavailable to handle a notification event.
	Upon OS Installation		This event does not affect system operation.
6001	Microsoft-Windows-Winlogon	Warning	The winlogon notification subscriber <GPClient> failed a notification event.
	Upon OS Installation		This event does not affect system operation.

ID	Source	Type	Message (Description)
	Timing		Action

System Event Log for Windows Server 2003 R2 x64			
4	b57nd	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
7011	Service Control Manager	Error	Timeout (30000 milliseconds) waiting for a transaction response from the Dfs service.
	Upon OS Installation		Unless this event is registered by restarting the system, there is no problem in operating the system.
10016	DCOM	Error	The application-specific permission settings do not grant Local Activation permission for the COM server application with CLSID {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NTAUTHORITY\LOCAL SERVICE} SID {S-1-5-19}. This security permission can be modified using the component Services administrative tool.
	Upon OS Installation		This event does not affect system operation.

Application Event Log for Windows Server 2003 R2 x64			
63	WinMgmt	Warning	A provider, HiPerfCooker_v1, has been registered in the WMI namespace, Root¥WMI, to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. A provider, WMIProv, has been registered in the WMI namespace, Root¥WMI, to use the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests.
	Upon OS Installation		This event does not affect system operation.
3009	LoadPerf	Error	Installing the performance counter strings for service C:\WINDOWS\syswow64\ipsecprf.ini (C:\WINDOWS\syswow64\ipsecprf.ini) failed. The first DWORD in the Data section contains the error code.
	Upon OS Installation		This event does not affect system operation.
5603	WinMgmt	Warning	A provider, Rsop Planning Mode Provider, has been registered in the WMI namespace, root\RSOP, but did not specify the HostingModel property. This provider will be run using the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. Ensure that provider has been reviewed for security behavior and update the HostingModel property of the provider registration to an account with the least privileges possible for the required functionality.
	Upon OS Installation		This event does not affect system operation.

ID	Source	Type	Message (Description)
	Timing		Action
System Event Log for Windows Server 2003 R2			
4	b57w2k	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	Upon system startup or upon applying Starter Pack		If the message appears upon system startup or upon applying Starter Pack, there is no problem in system operation.
1001	IPMIDRV	Error	The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMIBMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver. If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.
	When the server is in operation.		If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered. For more details, refer to "Enabling Microsoft Windows Server 2003 R2 Hardware Management" on the following site. [NEC Express5800 Web Site] http://www.58support.nec.co.jp/global/download/W2K3_R2/index.html
Application Event Log for Windows Server 2003 R2			
1003	EvntAgnt	Warning	TraceFileLevel parameter not located in registry:Default trace file used is %1.
	When the server is in operation.		This event does not affect system operation.
1015	EvntAgnt	Warning	TraceLevel parameter not located in registry:Default trace level used is 32.
	When the server is in operation.		This event does not affect system operation.
5603	WinMgmt	Warning	A provider, Rsop Planning Mode Provider, has been registered in the WMI namespace, root\RSOP, but did not specify the HostingModel property. This provider will be run using the LocalSystem account. This account is privileged and the provider may cause a security violation if it does not correctly impersonate user requests. Ensure that provider has been reviewed for security behavior and update the HostingModel property of the provider registration to an account with the least privileges possible for the required functionality.
	Upon OS Installation		This event does not affect system operation.

3. Accessing Data for Electric Power, Temperature, and Processor Utilization

This section describes how to access data related to input power consumption in watts, intake temperature, and all logical processor utilizations in the Express Server during usual operation in accordance with ENERGY STAR® Program Requirements.

3.1 Windows

The sample program below is verified to be run normally on Windows Server® 2008.

3.1.1 Power consumption

Execute the following commands to access power consumption readings on BMC (Baseboard Management Controller) via IPMI (Intelligent Platform Management Interface).

```
Network Function Code: 3Eh (Controller-specific OEM)

Command Code: 0Bh (Get Current Sensor Data)
```

Below is the sample file created by using Visual Basic Script (e.g. Power.vbs).

```
' Start Script
Option Explicit

' Prepare for IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root¥wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
          set oipmi = oinstance
next

'Format the IPMI command request
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
oinparams.networkfunction = &h3e   'OEM NetworkFunction
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h0b          'Get Current Sensor Data Command
oinparams.requestdatasize = 0


'call the driver
Dim outparams
set outparams = oipmi.execmethod_("requestresponse",oinparams)

WScript.Echo " Completion Code = 0x" & hex(outparams.Completioncode)
If outparams.Completioncode <> 0 Then
   Wscript.Echo " Not supported"
Else
   'WScript.Echo " Data LS Byte    = 0x" & hex(outparams.ResponseData(1))
   'WScript.Echo " Data MS Byte    = 0x" & hex(outparams.ResponseData(2))
   WScript.Echo " Power Consumption = " & outparams.ResponseData(2)*256 + _
                                          outparams.ResponseData(1) & " watts"
End If
' End Script
```

- Execution example

```
C:¥VBS> cscript //nologo Power.vbs
```

- Execution result

```
Completion Code = 0x0
Power Consumption = 76 watts
```

The power consumption is 76 watts.

Tips

Power consumption readings may not be acquired depending on the power supply configuration of the server.
The completion code in such cases is `0xC1` or `0xCB`.

3.1.2 Intake air temperature

Execute the following standard commands that conform to IPMI to search the SDR (Sensor Data Record) for the temperature sensor and obtain intake air temperature data.

- `Get SDR Repository Info`
- `Reserve SDR Repository`
- `Get SDR`
- `Get Sensor Reading`

Below is the sample file created by using Visual Basic Script (e.g. Sensor.vbs),

```
'Start Script
Option Explicit

' Prepare for MS IPMI Driver
Dim osvc, oclass
Dim oinstance, oipmi
set osvc = getobject("winmgmts:root¥wmi")
set oclass = osvc.get("microsoft_ipmi")
for each oinstance in osvc.instancesof("microsoft_ipmi")
          set oipmi = oinstance
next

' (Get SDR Repository Info)
Dim oinparams
set oinparams = oclass.methods_("requestresponse").inparameters
' (Get SDR Repository Info)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h20
oinparams.requestdatasize = 0
' Fire IPMI Command
Dim outparams
Dim i, RecordCount
set outparams = oipmi.execmethod_("requestresponse",oinparams)
RecordCount = outparams.ResponseData(3)*256 + outparams.ResponseData(2)

' (Reserve SDR Repository)
oinparams.networkfunction = &ha
oinparams.lun = 0
oinparams.responderaddress = &h20
oinparams.command = &h22
oinparams.requestdatasize = 0
Dim Reserve_LS, Reserve_MS
set outparams = oipmi.execmethod_("requestresponse",oinparams)
Reserve_LS = outparams.ResponseData(1)
Reserve_MS = outparams.ResponseData(2)

' (Get SDR) for each record
Dim Record_LS,Record_MS, Offset, Length
Dim cnt, sensorNum, sensorType
' First Record
Record_LS = 0
Record_MS = 0
For cnt = 0 to RecordCount-1
   Offset = 0
   Length = 9
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(Reserve_LS, Reserve_MS, Record_LS, Record_MS, Offset, Length)
   oinparams.requestdatasize = 6
   set outparams = oipmi.execmethod_("requestresponse",oinparams)
   If outparams.Completioncode = 0 Then
      If outparams.ResponseData(6) = 1 Then          ' Full Sensor Record
         call GetSensorType(Reserve_LS, Reserve_MS, Record_LS, Record_MS, sensorType)
         If sensorType = 1 Then                  ' Temperature
            WScript.Echo "========================================="
            call GetIDString(Reserve_LS, Reserve_MS, Record_LS, Record_MS)
```

```
            WScript.Echo " Sensor Type = Temperature"
            sensorNum = outparams.ResponseData(10)
            call GetSensor(Reserve_LS, Reserve_MS, Record_LS, Record_MS,sensorNum)
         End If
      End If
      Record_LS = outparams.ResponseData(1)
      Record_MS = outparams.ResponseData(2)
      If Record_LS = &hff And Record_MS = &hff Then
          exit For
      End If
   End If
Next

Sub GetSensorType(rv_ls, rv_ms, rc_ls, rc_ms, sensorType)
   Dim outtmp
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 12, 2)
   oinparams.requestdatasize = 6
   set outtmp = oipmi.execmethod_("requestresponse",oinparams)
   sensorType = outtmp.ResponseData(3)
End Sub

Sub GetSensor(rv_ls, rv_ms, rc_ls, rc_ms, sensorNum)
   Dim outtmp, units1, units2, sensortype
   oinparams.networkfunction = &ha
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h23
   oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 20, 14)
   oinparams.requestdatasize = 6
   set outtmp = oipmi.execmethod_("requestresponse",oinparams)

   units1 = outtmp.ResponseData(3)
   Select Case outtmp.ResponseData(4)
      case 0: units2 = "unspecified"
      case 1: units2 = "degrees C"
      case 6: units2 = "Watts"
      case else: units2 = "Refer to IPMI Specification: Type=0x" _
                          & hex(outtmp.ResponseData(4))
   End Select

   ' (Get Sendor Reading)
   Dim sensorData, rawData, currentValue
   oinparams.networkfunction = &h4
   oinparams.lun = 0
   oinparams.responderaddress = &h20
   oinparams.command = &h2d
   oinparams.requestdata = array(sensorNum)
   oinparams.requestdatasize = 1
   set sensorData = oipmi.execmethod_("requestresponse",oinparams)
   If sensorData.Completioncode <> 0 Then
      'WScript.Echo " Sensor Not Available"
      exit Sub
   End If
   rawData = sensorData.ResponseData(1)
   If units1 and &h40 Then
      If rawData And &h80 Then
         rawData = rawData Xor &hff
      End If
   Elseif units1 and &h80 Then
      call get2complement(rawData, rawData, 8)
   End If
   If (sensorData.ResponseData(2) And &h80) = 0 Or _
     (sensorData.ResponseData(2) And &h40) = 0 Or _
     (sensorData.ResponseData(2) And &h20) Then
      WScript.Echo " Event Status: Unavailable"
   Else
      'WScript.Echo " Event Status: ok"
      Dim M,B,k1,k2
      Dim ret
      M = (outtmp.ResponseData(8) And &hc0) * 4 + outtmp.ResponseData(7)
      B = (outtmp.ResponseData(10) And &hc0) * 4 + outtmp.ResponseData(9)
      call get2complement(M, M, 10)
      call get2complement(B, B, 10)
      call get2complement(outtmp.ResponseData(12) And &h0f, k1, 4)
      call get2complement((outtmp.ResponseData(12) And &hf0)/16, k2, 4)
      currentValue = CDbl (((M * rawData) + (B * (10 ^ k1))) * (10 ^ k2))
      WScript.Echo " Current Value = " & currentValue & " " & units2
   End If
End Sub

Sub get2complement(raw, rv, bit)
   Select Case bit
      case 4:
         If raw And &h8 Then
            rv = 0 - ((&h10 - raw) and &h0f)
```

```
            Else
                rv = raw
            End If
        case 8:
            If raw And &h80 Then
                rv = 0 - ((&h100 - raw) and &h0ff)
            Else
                rv = raw
            End If
        case 10:
            If raw And &h200 Then
                rv = 0 - ((&h400 - raw) and &h3ff)
            Else
                rv = raw
            End If
    End Select
End Sub

Sub GetIDString(rv_ls, rv_ms, rc_ls, rc_ms)
    Dim tmpMessage
    Dim outsdridstringtype
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 47, 1)
    oinparams.requestdatasize = 6
    set outsdridstringtype = oipmi.execmethod_("requestresponse",oinparams)

    Dim outsdridstring
    Dim idlength, j
    idlength = outsdridstringtype.ResponseData(3) and 31
    oinparams.networkfunction = &ha
    oinparams.lun = 0
    oinparams.responderaddress = &h20
    oinparams.command = &h23
    oinparams.requestdata = array(rv_ls, rv_ms, rc_ls, rc_ms, 48, idlength)
    oinparams.requestdatasize = 6
    set outsdridstring = oipmi.execmethod_("requestresponse",oinparams)
    tmpMessage = " ID String = "
    For j = 3 to idlength + 2
        tmpMessage = tmpMessage & Chr(outsdridstring.ResponseData(j))
    Next
    WScript.Echo tmpMessage
End Sub
'End Script
```

- Execution example

```
C:¥VBS> cscript //nologo Sensor.vbs
```

- Execution result

```
==========================================
 ID String = Baseboard Temp4
 Sensor Type = Temperature
 Current Value = 45 degrees C
==========================================
 ID String = Fnt Pnl Temp
 Sensor Type = Temperature
 Current Value = 27 degrees C
==========================================
 ID String = CPU1_DIMM1 Temp
 Sensor Type = Temperature
 Current Value = 35 degrees C
==========================================
 ID String = CPU1_DIMM2 Temp
 Sensor Type = Temperature
 Event Status: Unavailable
==========================================
```

Intake air temperature data is obtained from the sensor with an ID string that contains any of the following: `Amb`, `Ambient`, or `Front Panel`.

In the case of the sample above, the data is obtained from a sensor that contains `Fnt Pnl Temp` in its ID, with a resulting intake air temperature of 27°C.

3.1.3 Processor utilization

The utilization rate of all logical processors is given by executing the Win32_PerfFormattedData_PerfOS_Processor class that Windows OS provides. Below is the sample file created by using Visual Basic Script (such as Proc.vbs). This script outputs the processor utilization rate every 30 seconds.

```
' Start Script
strComputer = "."
Set objWMIService = GetObject("winmgmts:" _
   & "{impersonationLevel=impersonate}!¥¥" & strComputer & "¥root¥cimv2")
set objRefresher = CreateObject("WbemScripting.Swbemrefresher")
Set objProcessor = objRefresher.AddEnum _
   (objWMIService, "Win32_PerfFormattedData_PerfOS_Processor").objectSet
objRefresher.Refresh
Dim first
first = true
Do
  For each intProcessorUse in objProcessor
    If first Then
      If intProcessorUse.Name = "_Total" Then
        first = false
      End If
    else
      Wscript.Echo "Proc" & intProcessorUse.Name & " : " & _
                 "PercentProcessorTime=" & _
                 intProcessorUse.PercentProcessorTime
    End If
  Next
  Wscript.Sleep 30*1000   'sleep 30 * 1000ms
  objRefresher.Refresh
Loop
' End Script
```

- Execution example

```
C:¥VBS> cscript //nologo Proc.vbs
```

- Execution result

```
Proc0 : PercentProcessorTime=0
Proc1 : PercentProcessorTime=0
Proc2 : PercentProcessorTime=0
Proc3 : PercentProcessorTime=0
Proc4 : PercentProcessorTime=76
Proc5 : PercentProcessorTime=0
Proc6 : PercentProcessorTime=0
Proc7 : PercentProcessorTime=0
Proc_Total : PercentProcessorTime=9
```

`Proc 0` to `Proc 7` show the utilization rate of each processor while `Proc_Total` shows the total processor utilization rate.

3.2 Linux

The sample program below is verified to be run on Red Hat Enterprise Linux 5.

3.2.1 Power consumption

Power consumption is given by executing the following commands via IPMI to BMC.

```
Network Function Code: 3Eh (Controller-specific OEM)

Command Code: 0Bh (Get Current Sensor Data)
```

The example below uses the open-source software OpenIPMI driver and IPMITool. For Red Hat Enterprise Linux 5, OpenIPMI is provided as an inbox driver. IPMITool is provided in: OpenIPMI-tools-[version].rpm

- Execution example

```
# ipmitool raw 0x3e 0x0b
```

- Execution result

```
4C 00
```

Power consumption is given by calculating the 2-byte (16 bits) output value.

The second value 0x00 [15:8]

The first value 0x4C [7:0]

In the example above, power consumption = 0x004C (16 bits) = 76 (10 bits) watts.

Tips Power consumption readings may not be acquired depending on the power supply configuration of the server.
In such cases, either of the following messages is displayed.

```
Unable to send RAW command (channel=0x0 netfn=0x3e lun=0x0 cmd=0xb rsp=0xc1): Invalid Command
```

or

```
Unable to send RAW command (channel=0x0 netfn=0x3e lun=0x0 cmd=0xb rsp=0xcb): Requested sensor, data, or record not found
```

3.2.2 Intake air temperature

Intake air temperature is given by executing `IPMI` commands to BMC.

The example below uses Open IPMI driver and IPMITool that are open source software. For Red Hat Enterprise Linux 5, OpenIPMI driver is contained in Inbox driver. IPMITool is contained in: OpenIPMI-tools-[version].rpm

- Execution example

```
# ipmitool sdr type Temperature
```

- Execution result

```
Baseboard Temp4  | 31h | ok  | 45 degrees C
Fnt Pnl Temp     | 35h | ok  | 27 degrees C
CPU1_DIMM1 Temp  | 40h | ok  | 48 degrees C
CPU1_DIMM2 Temp  | 41h | ok  | 46 degrees C
CPU1_DIMM3 Temp  | 42h | ok  | 49 degrees C
CPU1_DIMM4 Temp  | 43h | ns  | No Reading
CPU1_DIMM5 Temp  | 44h | ns  | No Reading
CPU1_DIMM6 Temp  | 45h | ns  | No Reading
P1 Therm Ctrl %  | A0h | ok  | 0 unspecified
```

The output above shows the following in a line in order.

1st: Sensor name

2nd: Sensor number

3rd: Sensor status

`ok` indicates that the status has not reached a point of warning or danger.

4th: Sensor monitoring point

5th: The current reading of the sensor

The sensor indicating intake air temperature contains `Amb`, `Ambient`, or `Fnt Pnl Temp` in its name.

The data in the above example is obtained from the sensor that contains `Fnt Pnl Temp` in its ID and the intake air temperature is 27°C.

3.2.3 Processor utilization

The utilization rate of all logical processors is given by executing the `mpstat` command provided in a Linux distribution.

For Red Hat Enterprise Linux 5, `sysstat-[version].rpm` contains the command.

- Execution example

```
# mpstat -P ALL
```

- Execution result

```
Linux 2.6.18-164.el5 (localhost.localdomain) 11/17/09

17:59:30    CPU   %user   %nice    %sys %iowait    %irq   %soft  %steal   %idle    intr/s
17:59:30    all    1.23    0.04    0.42    2.69    0.03    0.10    0.00   95.49   1086.42
17:59:30      0    0.42    0.00    0.58    0.76    0.00    0.00    0.00   98.24    666.34
17:59:30      1    0.41    0.00    0.29    1.09    0.00    0.00    0.00   98.21      0.00
17:59:30      2    2.17    0.00    0.33    2.30    0.00    0.00    0.00   95.21      0.00
17:59:30      3    1.85    0.08    0.68    8.55    0.00    0.60    0.00   88.24    379.87
17:59:30      4    0.87    0.00    0.19    0.42    0.00    0.00    0.00   98.53      0.00
17:59:30      5    2.42    0.01    0.35    1.31    0.08    0.00    0.00   95.83      6.63
17:59:30      6    0.30    0.01    0.17    1.39    0.00    0.00    0.00   98.13      0.02
17:59:30      7    1.36    0.20    0.74    5.72    0.12    0.20    0.00   91.66     33.54
```

You can acquire the processor utilization rate by subtracting `%idle` from 100%.

7.2 NEC ESMPRO Manager

NEC ESMPRO Manager remotely controls and monitors the server hardware and RAID System.
To use these features, install the bundled software such as NEC ESMPRO Agent on the server.

Refer to "*NEC ESMPRO Manager Installation Guide*" or online help of NEC ESMPRO for details.